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WHITE PINE BLISTER RUST CONTROL IN NORTHEASTERN REGION

ANNUAL REPORT FOR 1948

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ACTIVITIES AND ACCOMPLISHMENTS IN NORTHEASTERN REGION DURING 1948

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WHITE PINE BLISTER RUST CONTROL IN THE NORTHEASTERN REGION

ANNUAL REPORT FOR 1948

HIGHLIGHTS OF 1948

1. Direct aid furnished by the states and local cooperators during year 1948 totaled \$310,523., an increase of \$42,539. or nearly 16% over 1947.
2. Federal 73.14 expenditures for the calendar year 1948 were \$157,498. or 47.6% less than for 1947 due to a reduction in the appropriation.
3. Although total 1948 eradication funds averaged 19% and man days 25% less than in 1947, the 968,163 acres worked was approximately the same as in 1947.
4. Greater use was made of scouts and small crews to speed up area coverage where ribes are few and scattered. As a result, the regional rate of acreage production was increased about 33% over 1947. This increase was from 17.4 to 23.1 acres per man day with ribes varying only from 4.2 to 3.7 bushes per acre. The 1948 production rate is an all time high for the region while the ribes per acre average is an all time low.
5. Greater experience in the mapping technique using aerial photographs resulted in a substantial increase in the rate of mapping coverage. Results for 1948 compared with 1947 show 78.3% as much mapping and remapping was accomplished with only 50% of the man days.
6. A low-cost and fairly simple process for reproduction of aerial photograph and black and white maps using a low-cost printer, which was developed by a New Hampshire district leader, was made available to all districts in New Hampshire through state purchase of a printing unit for each district.
7. Workers were available in sufficient numbers to meet all needs which was an improvement over 1947. In a few districts, particularly in Massachusetts, labor turnover was high.
8. Small scale tests were made of several one-man crew methods with results indicating the one-man unit can be used to advantage when ribes are light to medium in abundance.
9. The first regional conference in several years was held October 12-15 at the Pack Demonstration Forest at Warrensburg, N.Y. Attendance, totalling 53, represented the Bureau and Division in Washington, three blister rust control regions, the Division of Forest Pathology, the New York State Conservation Department and the New York State College of Forestry.

10. An analysis was made of the control problem in each state, (except Connecticut, Rhode Island and New Jersey where all control work is on a maintenance status) on the basis of past accomplishments, work yet to be done and relationship of control costs to white pine values. Included was a plan for the necessary eradication in each state to complete all pre-maintenance work and such maintenance work as is needed to bring all area on schedule with the work load, cost, and time factors set forth.
11. A complete revision was made of the field record system from the daily crew report to the permanent status records. In addition, the field manual for eradication workers was revised.
12. In Maine 13 county field demonstration meetings were held in cooperation with the Extension Service and the State Forestry Department.
13. The informational work was expanded with release of the four new blister rust films. Development of a new leaflet to replace Misc. Pub. No. 22 was started with indications that it will be ready for publication early in 1949.

Table 1 - Summary of 1948 Ribes Eradication Work

Operating Agency	Acreage Worked				Ribes Destroyed (Wild & Cult.)	Man Days
	First	Second	Other	Total		
Bureau-Coop.	206,515	410,068	350,835	967,418	3,555,999	41,798
Forest Service	30	210	505	745	6,123	63
Total	206,545	410,278	351,340	968,163	3,562,122	41,861

PART I

GENERAL STATEMENT

Introduction

Progress in control work in the Northeastern Region during 1948 was generally satisfactory based on funds available, but not nearly adequate to meet the full control needs for one year. This has been the situation in all years except one since termination of the emergency programs. Large amounts of additional work have been added as a result of the hurricane of 1938 and the extensive lumbering each year since. Consequently, the accumulated work load has become extremely large.

Some evidence of the problem involved is indicated by the fact that it would take from four to seventeen years at the 1947-48 rate of progress in the six states involved to complete only the basic work required to bring all area to the maintenance of control level. The urgent need, therefore, is for increased funds so a balanced program can be established and maintained. In 1948 adequate state and local money for the cooperator's share in a full program was provided by 5 states and a near-adequate amount by another. The two remaining, Maine and Vermont, were considerably short of the amounts needed to meet their part of the program financing. The greatest shortage, however, was in federal funds which fell far under both the amounts provided by the cooperators and the amounts needed as the federal share of an adequate program.

Importance of White Pine

The nine-state Northeastern Region has a forest area of about 61 million acres or about 60% of the total land area. This includes both hardwoods and softwoods in a variety of timber types. Within this forested area are the 4 million acres of white pine in our control area. On the basis of these figures, white pine, comprising only about 6.5% of the forested land, does not make a great impression. But from the production data, which reveals that the region's 1947 white pine cut amounted to 40% of all lumber and 65% of all softwood lumber produced, a better measure of white pine's importance is gained. It is by this measure that white pine ranks first in the list of lumber producing trees of the region.

There are other important values from the white pine forests of the region that cannot be measured as lumber. One of the highest is its aesthetic worth in connection with the very extensive and highly developed recreational business. Another is its great value as forest cover for watersheds that provide the domestic water supplies for many millions of people. Still others are related to the prevention of soil erosion by wind and water, the provision of cover for wildlife and the beautification of grounds surrounding homes. All together these "other uses" of white pine add greatly to the value of the species that ranks at the top for its lumber value alone.

Lumber production from white pine probably declined in 1948, but figures for that year are not yet available. This appears to be the second year of decreasing production since tentative data for 1946 and 1947 show a

drop from 1.33 billion to .85 billion board feet or 36%. It is estimated that adjustments in the data will show the production decrease to be nearer 25%. This is to be expected since the annual cut has been excessive for the past ten years making readily available saw timber very scarce in numerous localities. In this decade, about 7 billion board feet of white pine lumber have been cut or an average of 700 million board feet per year. A drastic reduction in the rate of cutting for a number of years is urgently needed to provide for the reestablishment of a favorable relationship between annual drain and annual growth. No recent calculations of this relationship are available but just prior to the 1938 hurricane, and therefore before the decade of excessively heavy logging, the estimate for all forests in New England was one eighth greater drain than growth with the heaviest drain in the white pine and the spruce-balsam types. In many places the total growth of 50 years or more was wiped out by the hurricane alone. In others, studies showed the 1941 cut alone to be as high as 20 times the growth. And over a large acreage excessive fire losses, particularly in 1941 and 1947, caused a severe setback. Couple with these the extremely high rate of cutting every year since 1938, a large part of which was in the young stands that yield the highest rate of growth, and it is apparent that the growth-drain relationship is greatly out of balance. It is obvious that restoration of a favorable balance in the white pine type is impossible while the present rate of depletion and practices in cutting operations continue. Even with drastically reduced cutting and continuation of current timber growing and harvesting practices, it would be at least 25 years before a favorable ratio could be attained.

Pine Infection Conditions

Although local rust outbreak areas are found from time to time in all parts of the region, there is no section that has an appreciable acreage of newly developed infection. In most districts there are areas of young pine, which have developed since logging or other major disturbance, in which the rust has gained a fresh start from new ribes bushes. Since these reproduction areas have the highest priority in the control schedule, they are being worked as rapidly as funds permit. It is inevitable, however, that many of these small infection centers will start so long as funds are inadequate for timely coverage of the very large acreage of young pine. The area in this class has been increasing rapidly as a result of excessively heavy cutting for 10 consecutive years while available funds have fallen short of needs in all but one of these years.

Data on the status of new pine infection in the region are gradually being accumulated through the continuing pine infection sampling program started in November, 1947. In the first year a total of 1,204 samples were taken on which 97,304 pines $1\frac{1}{2}$ to 10 feet in height were examined. These showed an average of 5.2% pines infected on which 80% of the cankers were started in the 5-year period 1942-1946. Since most of the pines examined originated in the first 6 or 7 years of heavy cutting following the 1938 hurricane, this evidence of rapid infection buildup since 1942 indicates that damaging amounts of the rust can develop in a few years on areas of reproduction from which early removal of the ribes is not possible.

The Control Problem

At the end of 1948 the control area of the Northeastern Region totaled 11,602,239 acres of which 4,089,800 acres support white pine that meets the minimum stocking standard requiring production of 50 or more crop trees per acre at maturity. These figures reflect reductions during the past year of 322,206 acres of control area and 54,547 acres of pine as a result of the discontinuation of areas that no longer meet the pine stocking requirements and the narrowing of protection strips where possible. In these net adjustments, however, are included numerous increases in pine area and the necessary protecting acreage representing areas of young white pine not previously included.

In addition to the active acreage of white pine in the control area there are, according to the best available information, about 1 $\frac{3}{4}$ million acres in other white pine or white pine-hardwood type areas in the region. Although some of this meets the minimum requirements for control except for its location at some distance from the present control districts, the major part is made up of scattered, sub-standard areas. A small amount is included in the merchantable pine stands with little or no white pine reproduction present or expected after cutting, the acreage of which is carried in the district records but not included in the active control area.

The major control problem in the region is coverage of the very large acreage of land from which white pine has been cut in the past decade. It is now 11 years since the hurricane of September 1938 which started the unprecedented lumbering boom, but it was the pre-war, war, and post-war demands for more and more lumber that increased the tempo of cutting. To complicate matters further all consideration of reasonable cutting practices was abandoned except in few and scattered instances. Clear cutting, spurred by the great demand for logs of any size that would cut dimension lumber, and later that would make pulpwood, has been the most common practice. The result has been a tremendous reduction in the thrifty growing stock that should have been the next mature crop, and the cluttering and choking with debris of large acreages many of which were left without seed trees for restocking. In the aggregate these 10 years of accelerated lumbering have left the region with at least 1,500,000 acres of cutover white pine land within the control area or about 37% of the total.

Status of Mapping

Mapping of the pine and control area in the region has been extended to 8,657,408 acres or about three-fourths of the total control area. Only one state, Connecticut, is completely mapped although Vermont approaches this status at 98%. The others range from 53% in New Hampshire to 89% in Rhode Island.

A large part of the completed mapping was done during the Emergency Program period and is now 10 or more years old. During the past decade much of this mapped area has been affected in whole or in part by the hurricane, cutting operations and fire. Consequently, the remapping of control area is also an important phase of control operations although one which is not reflected in the progress of mapping summary. Over the past three years the

total amount of remapping has been only slightly less than the amount of initial mapping. In 1948 the acreage remapped exceeded the acreage mapped initially. The amount of remapping necessary each year is increasing and within a few years will become the major activity of the mapping phase. Table 55 in the Appendix shows the current status of mapping by states and districts.

Status of Ribes Eradication Work

Of the 11,602,239 acres in the control area in 1948, 93% has been given the first working, 50% the second, and 11% the third or more. The acreage given this pre-maintenance treatment that has been classified as in the maintenance of control category amounts to 36% of the total control area. Table 2 shows this status of control work by land ownership classes, while Tables 54 and 55 in the Appendix give a more detailed summary by states and districts.

Table 2 - Status of Ribes Eradication Work, December 31, 1948

Land Ownership Class	Acreage of Control Area	Acreage Worked			Acreage on Main-tenance	Percentage of Control. Ar			
						Worked			On Main team
		Once	Twice	Other		Once	Twice	Other	
State & Private	11,577,059	10,729,239	5,780,267	1,296,071	4,123,858	92.7	49.9	11.2	35.
National Forest	8,308	8,308	6,262	4,425	5,978	100.0	75.4	53.3	72.
National Park	16,872	16,872	16,872	8,207	16,872	100.0	100.0	48.6	100.
Totals	11,602,239	10,754,419	5,803,401	1,308,703	4,146,708	92.7	50.0	11.3	35.

The total of unworked area was brought under the one million acre mark in 1948 as the result of 206,545 acres of initial work. An additional large reduction resulted from discontinuation of over 160,000 acres with sub-standard pine in western New York. The combined effect of all changes reduced the unworked total to 847,820 acres distributed as follows:

Maine	221,697	acres
N.H.	137,225	"
Vt.	181,309	"
Mass.	27,531	"
N.Y.	193,305	"
Penna.	86,753	"

The unworked area is now totally state and private land since the small amount of remaining initial work on federal land was worked in 1948. Of the total federal land, about 91% is on maintenance. However, some change in this will be necessary when the Acadia National Park control area that was burned in 1947 is remapped and checked.

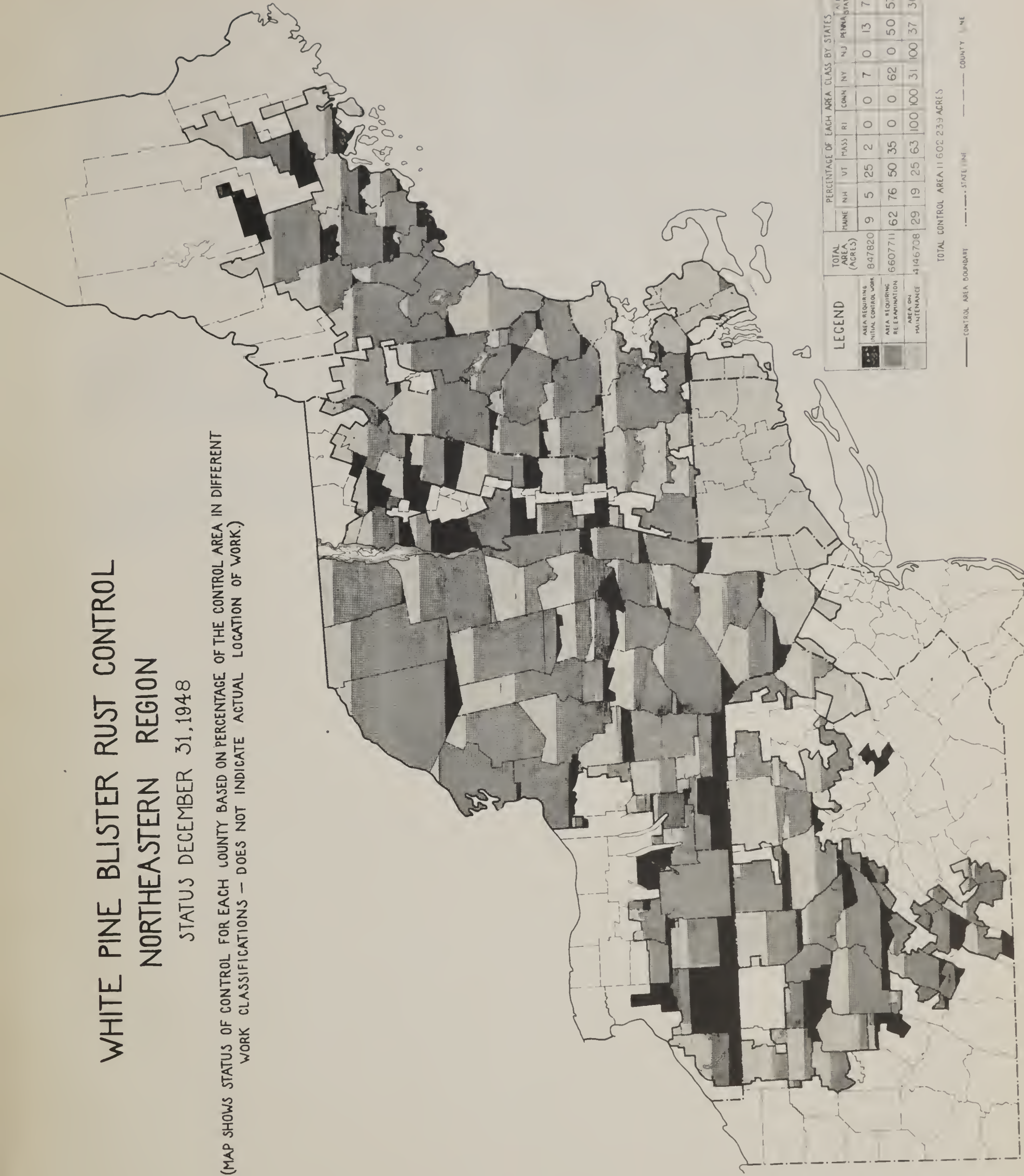
The total area now on maintenance, which amounts to 4,146,708 acres, is 35.7% of the present control area. Of the 6,607,711 worked acres not on maintenance, a high percentage can be shifted to this class with only an examination or a scout type working. The task of covering over 6 million acres is a large one, though, so this phase will progress rapidly only when sufficient funds for a full scale program are available.

The status of the control problem in the region is depicted graphically on the map that follows. This shows the proportionate amounts of area, by county, that still require pre-maintenance initial work (black) and examination or rework (dark crosshatch). The area requiring only maintenance work (now in maintenance class) is indicated by the lightly shaded portions.

WHITE PINE BLISTER RUST CONTROL NORTHEASTERN REGION

STATUS DECEMBER 31, 1948

(MAP SHOWS STATUS OF CONTROL FOR EACH COUNTY BASED ON PERCENTAGE OF THE CONTROL AREA IN DIFFERENT WORK CLASSIFICATIONS — DOES NOT INDICATE ACTUAL LOCATION OF WORK.)



Methods Developments

Special efforts are being directed continually toward increasing the productiveness of workers through more intensive training, closer supervision and improvements in working methods. One of the more successful developments in this connection is the use of more thoroughly trained scouts and small crews. Results from preliminary tests of various one-man crew methods substantiate favorable results from other tests using small crews of one to three men. Although the possibilities of increased production through use of small working units and various working procedures have not been thoroughly explored, the efforts thus far have aided in gaining production increases in 1947 and again in 1948. This is particularly the case for rework areas where the ribes populations are small. The two graphs that follow show this trend as part of the complete 1918-1948 record of ribes per acre - acres per man day relationships for first working and for reworkings.

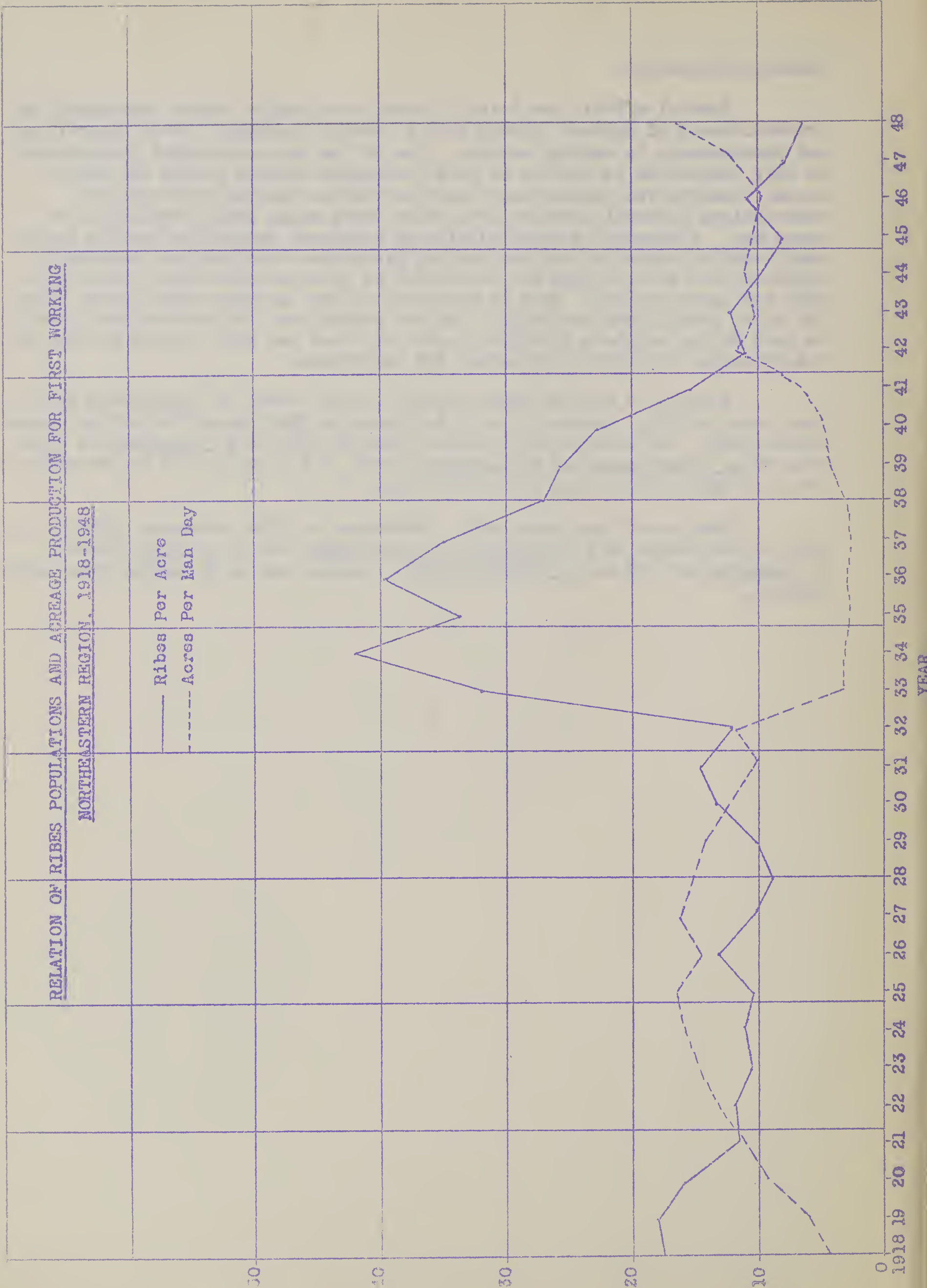
Tests of 2,4-D and Amate applied to the crowns of decapitated ribes were made in 1947. Checks of the 2,4-D plots in 1948 showed 64% of the treated bushes dead. The effectiveness varied from 36% kill of R. cynosbati to 100% kill of R. glandulosum and R. lacustre. Thus, 2,4-D appears to be satisfactory for only part of the ribes of the Northeast.

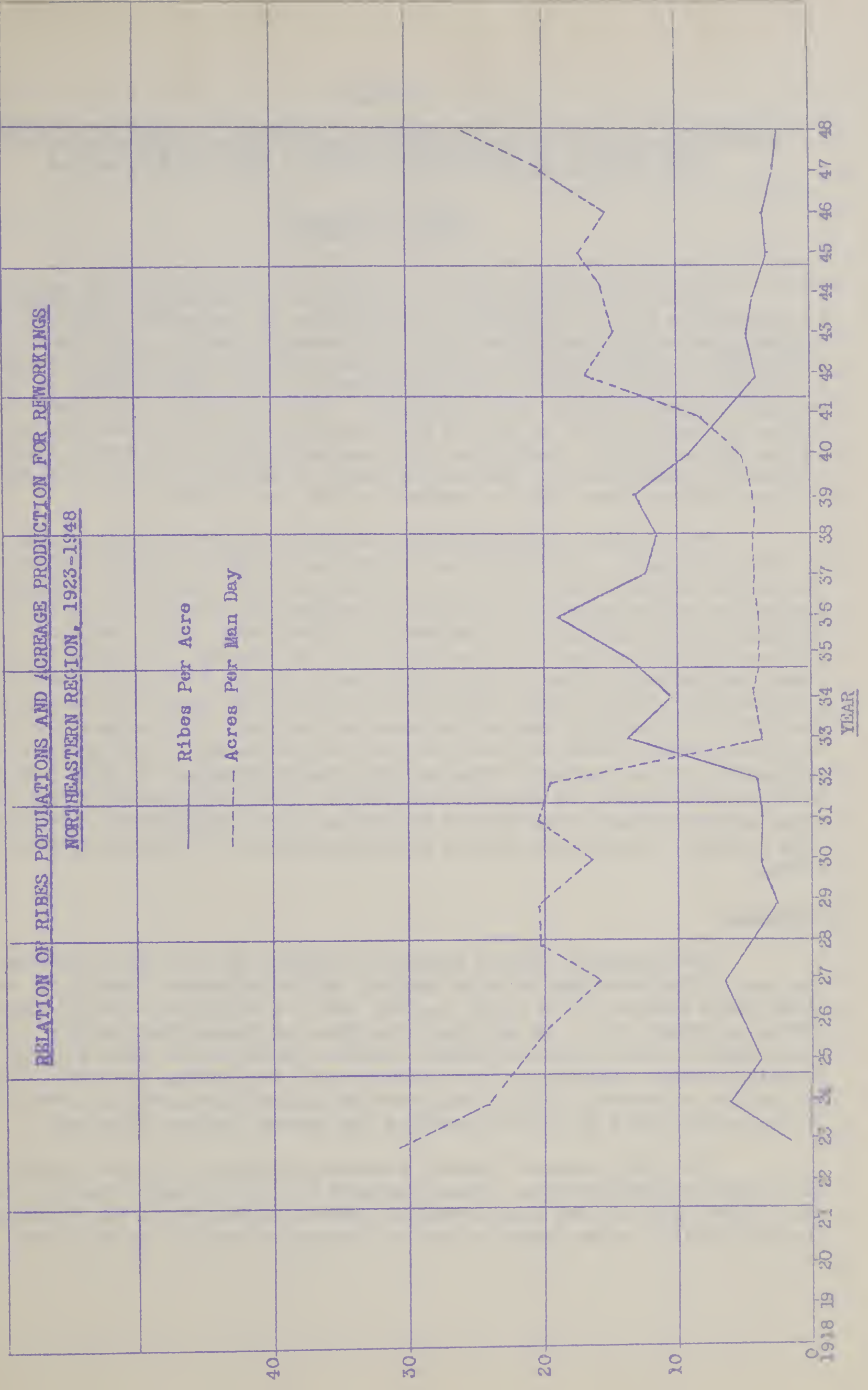
Results of the Amate tests, determined in 1948, averaged 75% kill with 100% effectiveness on R. cynosbati, R. americanum, and R. sativum, 90% on R. lacustre and 60% on R. rotundifolium. A small test on R. aureum gave negative results.

RELATION OF RIBES POPULATIONS AND ACREAGE PRODUCTION FOR FIRST WORKING

NORTHEASTERN REGION, 1918-1948

— Ribes Per Acre
----- Acres Per Man Day





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PART II

LEADERSHIP, COORDINATION, AND TECHNICAL DIRECTION OF WHITE PINE BLISTER RUST CONTROL IN NORTHEASTERN REGION - WORK PROJECT BIR-1-1

GENERAL STATEMENT

Under Work Project BIR-1-1, the Bureau of Entomology and Plant Quarantine is responsible for the leadership, coordination and technical direction of all blister rust control activities in the Northeastern Region. Such activities during 1948 included cooperative work on state and private lands in the six New England States, New York, and Pennsylvania, and a small project on the White Mountain National Forest in New Hampshire. No control work was deemed necessary during the current year on the two other national forests in this region or at Acadia National Park. Operations have been suspended in New Jersey since 1937. The entire control area of only 16,742 acres in that state is on maintenance, but some followup work will be required in the near future.

The Bureau's responsibilities are administered by the regional office at Cambridge, Mass., which provides the over-all project planning and coordinates all of the control activities into a uniform program. Under the cooperative agreements with each state, the Bureau furnishes the services of technical employees (state and district leaders) in accordance with the needs of the work and availability of funds. In New Hampshire and Vermont, the district leaders spend one quarter of their total time on state forest fire control work and a proportionate share of their total costs is paid from forest fire control funds. Each of the cooperating states furnishes the services of a responsible state employee (usually state forester) who has nominal charge of the program and is responsible for all matters concerned with the enforcement of state laws and policies with respect to blister rust control. The states also furnish office space and other facilities for our leaders at state headquarters and cooperate with counties, towns, associations and individuals in the local eradication of ribes.

Personnel

The permanent federal personnel assigned to the control program at the end of 1948 consisted of nine regional office employees (excluding Rusden), seven state leaders, 24 district leaders, and one full-time clerk at the state office in Albany, N.Y. In addition, the State of Connecticut employs a full-time leader in the Litchfield County district, while in New York a state district forester directs control operations in the Oneonta district. Since the middle of October, 1948 a state foreman has been assigned to survey work in the western part of New York outside the present control districts.

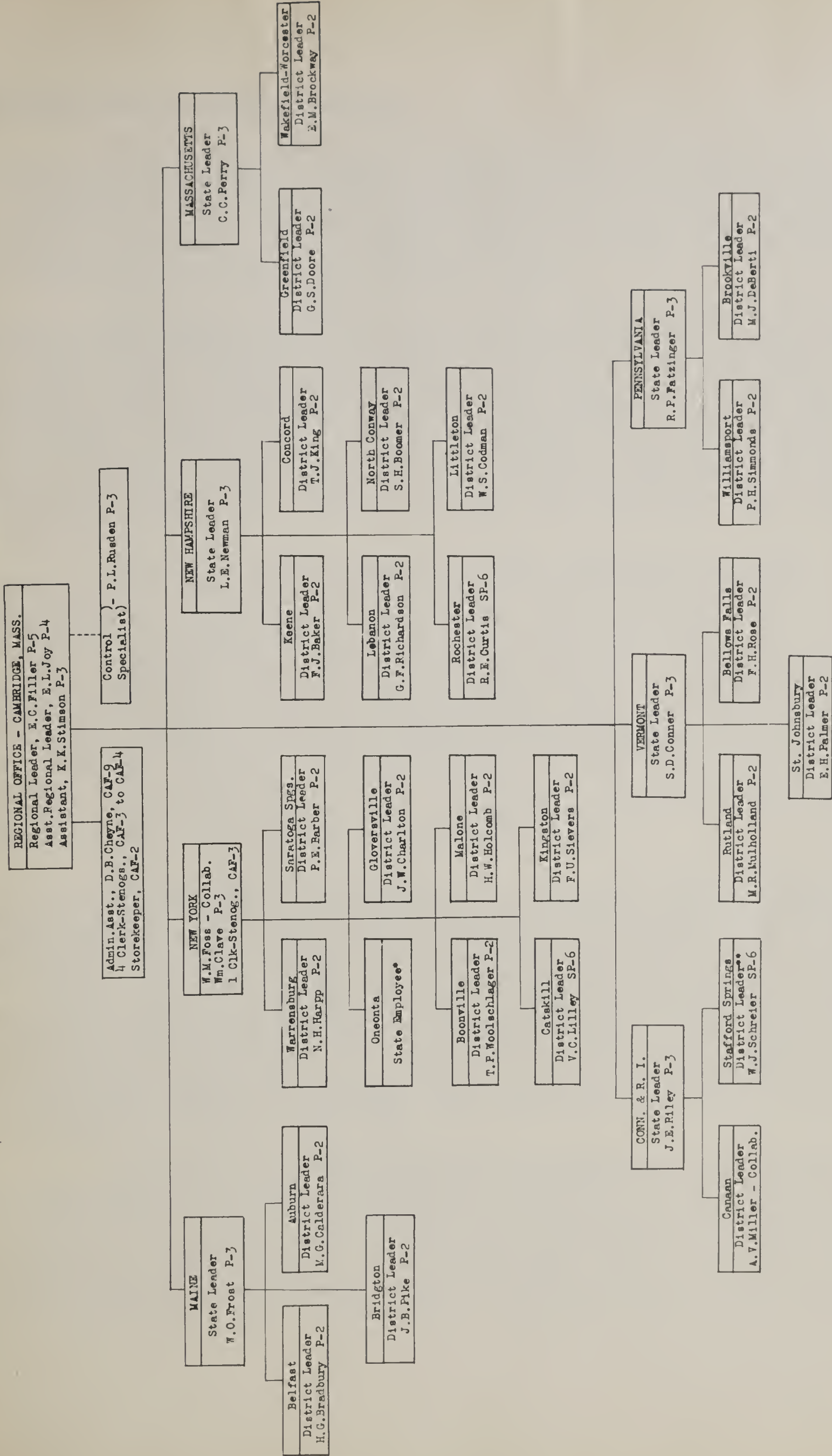
The only permanent federal personnel changes during the current year were three new appointments. These included SP-6 appointments for two state-paid supervisors who had been directing control operations in the Rockingham County District in New Hampshire and the Schoharie District in New York.

The vacant CAF-2 Storekeeper position at the Cambridge regional office was filled on October 18, 1948 by the appointment of Mr. James M. Perry, who was referred by the Boston Office of the Civil Service Commission.

District Leader Simmond's headquarters were changed from Stroudsburg to Williamsport, Penna. effective July 1, 1948.

The Connecticut state leader also directed all control activities in Rhode Island during 1948 and the field work in the latter state was supervised by the district leader located in eastern Connecticut.

The following organization chart shows the assignments of permanent personnel on blister rust control in this region as of December 31, 1948.



*State District Forester Hick gives general supervision to control activities in this district.

**Supervises work in eastern Connecticut district and all work in Rhode Island.

District Leaders in New Hampshire and Vermont spend one-quarter of their time on forest fire protection and other forestry activities.

Informational and Service Activities

Informational and service work is of special importance in those states where the control program is largely dependent on local cooperation such as town appropriations in Maine, New Hampshire and Vermont, but such activities are essential in all states to keep cooperating agencies and the public informed regarding the disease, control methods, status of the work, and particularly the urgent need for reworkings to maintain control.

The volume of informational and service work performed by the district leaders during 1948 was about the same as in recent years, but special emphasis was given certain phases. For example, a series of 13 field demonstration meetings was held in Maine during July and August in cooperation with the Extension Service and the Maine Forest Service to acquaint the public with the seriousness of blister rust. Although the attendance at some of these meetings was rather disappointing, the participants included representatives from various state and federal forestry agencies, timber and lumber companies, and other pine owners, who showed a keen interest in blister rust control and other forest management problems.

Showings of the new blister rust films highlighted the 1948 informational activities in many districts and reports indicate that all of the new films were enthusiastically received. Four prints each of the Northeastern and General films and one each of the North Central and the Southern Appalachian were obtained for use in this region. Two new sound projectors were also received in February, 1949. These new films and projection equipment will play an important role in future informational activities. During the calendar year 1948, the district leaders presented blister rust films at 97 meetings attended by 10,245 individuals. Of this total, New York had 37 showings with an attendance of 7,246, while Vermont had 30 showings for 1,683 persons. In the former state, films were shown for the first time with excellent results at summer camping areas on state forest lands.

Special emphasis was also given to blister rust exhibits during 1948. One outstanding example was the large exhibit included in the Maine Forest Service display at the Eastern States Exposition in Springfield, Mass. during September. A detailed description of this exhibit is given on Page 16 of Mr. Frost's 1948 annual report. The importance of exhibits may be indicated by the fact that one of the Vermont leaders placed small blister rust exhibits, chiefly in post-offices, just prior to the annual meetings in all towns where cooperation was solicited in 1948. All 15 of these towns raised money for control work. Similar results were obtained in this district in 1949 when 16 towns were requested to cooperate. This leader had 26 of the 32 blister rust exhibits in Vermont during 1948.

A new phase of informational work was inaugurated by Mr. Clave in New York during 1947 when he developed and conducted a special blister rust training course for the forestry students at the New York State Ranger School at Wanakena. The success of this effort is attested by the fact that he was requested to repeat the course at the Ranger School this year and also give similar instruction to the State College of Forestry juniors in camp at the Pack Demonstration Forest in Warrensburg. A modified version of the course

was also given several groups of state forest rangers during 1948 and other groups of practicing foresters may be included in future training courses.

Several papers covering the important phases of informational and service activities were presented at the regional conference in Warrensburg, N.Y. during October. At that time the need was stressed for extending conservation and blister rust education to high and grade school levels. Such a course was recently developed and tested in his own high school by a principal employed during the summer on the control project in Maine. His plan will be submitted to the State Division of Education for consideration.

The need for new publications was also stressed at the Warrensburg conference. It was suggested that Miscellaneous Publication No. 22 be completely revised and modernized by an entirely new approach to the subject - the control angle. There is also need for a Farmers' Bulletin on blister rust and possibly an illustrated leaflet similar to those on other pests.

Table 3 summarizes the 1948 informational and service activities, by states, while the following tabulation gives a comparison of the 1948 accomplishments in all states with those of the previous year:

	<u>1947</u>	<u>1948</u>	<u>% Increase or Decrease in 1948</u>
Meetings addressed.....	260	362	+39.2
Attendance at meetings.....	19,167	13,793	-28.2
News items published.....	181	158	-12.7
Demonstrations placed.....	124	142	+14.5
Initial interviews.....	5,693	4,887	-14.2
Follow-up calls.....	3,619	3,535	- 2.3
Persons instructed in field..	2,710	3,233	+19.3

It will be noted that the number of meetings addressed by the district leaders increased 39.2% during 1948, but there was a decrease of 28.2% in attendance. Most of this decrease was in New York where 7,809 persons attended 92 meetings in 1947, but only 2,737 individuals were present at the 76 meetings held by our leaders in that state this year. The same is true concerning the decrease in news items. Only 39 were published in New York during 1948 as compared with 73 the previous year. Several excellent items were published just prior to 1948 and 1949 town meetings, especially in New Hampshire, including one written by Mr. Robert Monahan, forester in charge of the Dartmouth College Grant. Noteworthy increases occurred in the number of demonstrations placed and the number of persons given field instruction regarding the disease and control methods. On the other hand, there were decreases in number of initial interviews and follow-up calls. Maine had increases in all phases of their informational and service activities during 1948, while New York showed decreased in all items except demonstrations. There was a big increase in number of meetings held in New Hampshire - 174 in 1948 as compared with 95 the previous year.

Table 3 - Summary of 1948 Informational and Service Activities of
District Blister Rust Control Leaders in Northeastern Region

Informational Activities

State		Meetings Addressed		No. Items Published	No. Demonstrations Placed
		No.	Attendance		
Maine		31	423	23	31
N. H.		174	7,265	77	40
Vt.		57	2,756	13	32
Mass.		1	55	2	0
R. I.		4	20	0	2
Conn.		15	409	0	12
N. Y.		76	2,737	39	17
Penna.		4	128	4	8
All States		362	13,793	158	142
Average Per Leader	1948	13.4	510.9	5.9	5.3
	1947	9.3	684.5	6.5	4.4

Service Activities

State		No. Initial Interviews	No. Follow-up Calls	No Individuals Instructed in Field
Maine		1,027	346	700
N. H.		939	1,482	675
Vt.		430	600	48
Mass.		548	42	29
R. I.		21	5	28
Conn.		460	173	97
N. Y.		1,055	815	961
Penna.		407	72	695
All States		4,887	3,535	3,233
Average Per Leader	1948	181.0	130.9	119.7
	1947	203.3	129.2	96.8

Cooperation With Other Agencies

Effective relationships were maintained in all states during the year between the personnel of our Division and representatives of other forestry and agricultural agencies as well as numerous allied local organization, such as the County Forestry Committees in New York and the County Forestry Advisory Boards in New Hampshire. Many of our leaders worked in close cooperation with other private, state and federal foresters in their white pine management problems, especially in giving advice on control and marking of blister rust damaged trees for salvage cutting. As a result of special efforts through conferences and field demonstrations these foresters, county agricultural agents and others now have a better understanding of blister rust and its control. For example, in Vermont, the state leader recently sent letters to the 11 county foresters in that state thanking them for providing information to local people regarding the blister rust project in order that they might vote intelligently on town items for blister rust control. In Maine the district leaders held 13 county field demonstration meetings in cooperation with the Extension Service and the State Forestry Department. At the request of the state officials, our leaders in several states have taken an active part in periodic conferences of the forestry personnel. In New York, five of the 15 district foresters are former blister rust control leaders. More effective cooperation was maintained with various forestry schools in the region.

District Leader Holcomb of New York was detailed to farm forestry work during the period December 1, 1947 to March 15, 1948. Several of our leaders in New England again assisted the Division of Japanese Beetle, Gypsy and Brown-Tail Moths Inspection and Certification during the Christmas tree shipping season by inspection and certifying small non-commercial shipments which were brought to their offices.

As in 1947, the East Orange, N.J. office of our Bureau gave valuable assistance by reproduction of several thousand copies of the new field forms and a supply of the revised field manual. The Division of Gypsy and Brown-Tail Moths Control at Greenfield, Mass. provided storage space over winter for several of our automobiles and an office for District Leader Doore.

Bond Purchases By Permanent Personnel

During the calendar year 1948, permanent federal employees purchased savings bonds under the payroll deduction plan amounting to \$8,815. or 5.27% of the gross payroll. This represents a decrease of 18% compared with the previous year. At the present time, 24, or 57.1% of the 42 employees, are still participating in the payroll deduction plan and allotting 8.5% of their gross salaries for bond purchases.

Table 4 - Total Expenditures and Contributed Services For Work Project BLR-1-1
During Calendar Year 1948

State	Value of Contributed Services By States*	B.E. and P.Q. Expenditures (71.14)	Total
Maine	\$1,500.00	\$17,855.12	\$19,355.12
N.H.	300.00	25,455.50	25,755.50
Vt.	852.00	16,136.81	16,988.81
Mass.	0	13,930.84	13,930.84
R.I.	132.00	-	132.00
Conn.	933.34**	5,154.79	6,088.13
N.Y.	3,000.00	31,811.82	34,811.82
Penna.	384.00	14,092.84	14,476.84
All States	\$7,101.34	\$124,437.72	\$131,539.06

*Technical services of state employees

**Includes \$200. chargeable to Project BLR-2

Table 5 - Federal 71.14 Expenditures For Work Project BLR-1-1
During Calendar Year 1948

State	Salaries of Appointees	L/A	Leases	Total
Maine	\$17,520.46	\$2.66*	\$332.00	\$17,855.12
N.H.	24,795.50	-	660.00	25,455.50
Vt.	16,136.81	-	-	16,136.81
Mass.	13,930.84	-	-	13,930.84
Conn.	5,154.79	-	-	5,154.79
N.Y.	31,530.32	-	281.50	31,811.82
Penna.	13,930.84	-	162.00	14,092.84
All States	\$122,999.56	\$2.66	\$1,435.50	\$124,437.72

Tables 4 and 5 do not include Federal 71.14 expenditures for the Cambridge regional office totalling \$45,833.44 which consisted of \$40,120.97 for the salaries of appointees, \$5,662.47 L/A expenditures, and \$50.00 for a lease. Dr. Rusden's salary and expenses for the entire year are included in the Cambridge Office expenditures.

*Fiscal year 1947 obligation which was not paid until after January 1, 1948.

PART III

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATELY-OWNED LANDS IN NORTHEASTERN REGION - WORK PROJECT BLR-3-1

GENERAL STATEMENT

Control work is conducted on state and privately-owned lands under a cooperative agreement in each state between the U. S. Bureau of Entomology and Plant Quarantine and the authorized state regulatory agency - usually the state forestry department. Under the provisions of the Lea Act, federal funds are allocated for control work in cooperation with states, counties, towns, associations, and individual pine owners.

The present net control area on state and privately-owned lands in this region comprises 11,577,059 acres, of which 4,084,359 acres supports white pine growth meeting stocking requirements for blister rust control. At the end of 1948, initial ribes eradication work had been completed on 92.7% of the control area, about 50% had been worked twice, 11.2% three times, and 35.6% was on maintenance. First work is still needed on 847,820 acres and 6,605,381 acres will have to be examined and any necessary rework performed before the areas can be placed on maintenance.

The control problem has been greatly complicated during the past decade as a result of two hurricanes in New England, the greatly accelerated cutting of white pine in all states, and destructive forest fires during 1947, especially in southwestern Maine. It is estimated that nearly a million and a half acres of white pine have been cut in this region since 1938. Indications are that a high percentage of these cut-over areas are restocking to white pine, but timely action is required to eliminate any ribes regrowth and prevent serious damage by the rust.

State and Local Cooperation

In Maine, New Hampshire, Massachusetts, Connecticut and New York, state funds are appropriated specifically for blister rust control, while in Vermont, Rhode Island and Pennsylvania, allotments for this purpose are made from appropriations for general forestry or pest control work. Additional state funds were also allotted from other state appropriations during 1948 in Massachusetts and New York. Total state expenditures and contributed state services for Project BLR-3-1 during the calendar year 1948 amounted to \$235,301.19, an increase of 20.3% over 1947 and 70.7% more than in 1946. State appropriations for control work during the fiscal year 1949 were approximately the same as for the previous year, except in New York where the appropriation was increased from \$100,000 to \$123,000.

In New York, 14 counties appropriated \$16,325 for control work during 1948. Total expenditures, however, amounted to \$17,063.52, including \$975 for value of contributed services.

Town cooperation was solicited in Maine, New Hampshire, Vermont and Connecticut during 1948, and a total of 198 towns in these four states provided \$56,406.30 for cooperative ribes eradication work as compared with \$52,609.62 appropriated by 187 towns in 1947. The 1948 funds included \$1,407.30 carried over from 1947 as unexpended appropriations in 4 towns, and \$10,500 in compulsory appropriations by 29 towns where the state law was applied in New Hampshire. One Massachusetts town also contributed \$145.52 for control work on its watershed properties in 1948. Under the sinking funds plan in Connecticut, there was an unexpended balance of \$10,654.82 in the blister rust control accounts of the 22 participating towns at the end of 1948. In 13 of these towns, the funds are kept in a separate blister rust control account, while in two other towns the sinking fund includes blister rust control and one or more other projects. In the remaining seven towns, the money is available when needed but not set up in a special account.

As in recent years, very little individual cooperation was solicited during 1948 when 28 individuals spent \$4,013.14 on blister rust control. This amount includes \$168.00 spent by one cooperator on canker elimination work.

The following table summarizes all local cooperation during 1948 by states:

Table 6 - Local Cooperation on Blister Rust Control Work During 1948

Individual Cooperation

State	No. Cooperators		Amount Spent by Individual Cooperators
	Ribes Eradication	Canker Elimination	
Vt.	2	--	\$ 76.65
Mass.	18	--	2,914.94
Conn.	3	--	746.75
N. Y.	4	1	274.80
All States	27	1	\$4,013.14

Town Cooperation

State	Appropriations		No. Town Contributions	Amount Town Money Expended
	No.	Amount		
Maine	36	\$ 7,257.30	-	\$ 5,730.73
N. H.	119	41,234.00	-	41,163.52
Vt.	30	6,000.00	-	5,937.55
Mass.	--	-	1	145.52
Conn.	13	1,915.00	-	1,168.48
All States	198	\$56,406.30	1	\$54,145.80

Town appropriations in Maine include \$407.30 held over from 1947 appropriations in three towns.

In New Hampshire, the data include 3 appropriations totalling \$1,000 held over from 1947 and 29 compulsory appropriations amounting to \$10,500.

County Cooperation

County cooperation was restricted to New York where 14 counties appropriated a total of \$16,325 for control work. Total expenditures amounted to \$17,063.52 which includes \$975 for value of contributed services.

During the calendar year 1948, total state and local cooperative expenditures and contributed services for Project BLR-3-1 amounted to \$310,523.65, an increase of 15.9% over the previous year. In fact, there has been a steady increase in such cooperation since 1941 when federal funds were first made available for cooperative ribes eradication work under the provisions of the Lea Act. For the seven full calendar years (1942-1948, inclusive), direct aid by the states and local cooperators totalled \$1,106,267.89, increasing from \$74,957.87 in 1942 to \$310,523.65 during the current year, as shown in the following table:

Table 7 - State and Local Cooperative Expenditures and Contributed Services
For Project BLR-3-1 During Period 1942-1948, Inclusive

Calendar Year	States	Counties	Towns	Individuals	Total
1942	\$ 47,628.17	\$ 9,534.75	\$ 15,601.04	\$ 2,193.91	\$ 74,957.87
1943	50,315.35	7,552.88	17,400.82	906.56	76,175.61
1944	56,307.48	11,536.91	17,686.72	833.98	86,365.09
1945	63,509.81	12,162.14	25,039.62	360.85	101,072.42
1946	137,858.85	15,366.66	31,414.71	4,614.71	189,254.93
1947	195,595.14	16,886.81	47,842.22	7,594.15	267,918.32
1948	235,301.19	17,063.52	54,145.80	4,013.14	310,523.65
Total	\$786,515.99	\$90,103.67	\$209,130.93	\$20,517.30	\$1,106,267.89

Federal 73.14 expenditures during the period 1942-1948, inclusive, totalled \$1,148,786.39. However, excluding obligations for salaries of appointees and overtime pay, the total to be matched by the states and local cooperators was \$1,068,090.23. Actually they exceeded this amount by \$38,177.66.

Control Area Examination and Mapping Work

It was necessary to curtail control area examination and mapping activities in several of the states during 1948 due to shortages of funds. Only six mappers were employed on federal L/A money from January to April - four in New Hampshire, and one each in Connecticut and Pennsylvania. Eighteen federal L/A workers were retained for mapping work in seven states after the close of the 1948 ribes eradication season, but this number was reduced to six (five in

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New Hampshire and one in Pennsylvania) early in 1949 when it was learned that no deficiency appropriation would be available to cover salary increases for all classified federal appointees and that such obligations would have to be paid from 73.14 L/A balances. State funds were used in New York to retain from 20-25 key men during the 1948 mapping season, and a few state employed mappers were provided in Connecticut and Pennsylvania.

In spite of the reduction in personnel assigned to such activities, 451,742 acres were mapped in detail during 1948 and an additional 1,419,685 acres examined to determine the present pine stocking and/or control requirements as a result of 4,595 man-days labor. Compared with the previous year's accomplishments, there were decreases of 22.7% in acreage detail mapped and 28.5% in acreage examined. However, there was a decrease of 50% in man days expended on such activities. This indicates much higher production rates on the 1948 examination and mapping work, but it is not possible to compute information on the acreages mapped per man day since no segregation was made of the time spent on mapping and examination work. Early in 1949 arrangements were made for reporting time separately for each phase of the work.

The 1948 examination and mapping work resulted in a net reduction of 321,717 acres in the total control area on state and private lands and 54,383 acres in the white pine acreage. The largest decrease occurred in New York which had a net reduction of 226,615 acres in the control area and 34,852 acres in the pine area. The bulk of the area discontinued in New York this year was in the western part of the state where the pine consists chiefly of scattered woodlots and plantations.

Aerial photographs were used on most of the 1948 mapping work in accordance with the standardized regional procedure developed in the fall of 1946. However, New Hampshire used a modified procedure which was described in detail on Page 24 of our 1947 annual report. A new mapping manual for New Hampshire was issued early in 1948. It was compiled by State Leader Newman and District Leader Curtis and entitled, "The Utilization of Aerial Photographs in the Production of White Pine Blister Rust Control Maps." Mr. Curtis also developed an excellent inexpensive printing box for use in making reproductions and the state procured one of these machines for each of the district leaders. Nearly 1,200 additional aerial photographs were purchased during 1948, chiefly for districts in New York and Pennsylvania. Since 1944, a total of over 7,300 photographs have been purchased with federal funds for use on the control program in this region. Several of the leaders have also had access to photographs owned by state or other federal agencies, especially the S.C.S. offices in Pennsylvania.

Table 8 - Results of Control Area Examination and Mapping Work - 1948

State	Work Performed By	Acreage Detail Mapped			Additional Acreage Examined But Not Mapped			Total Man Days
		Initial Mapping	Re-Mapping	Total	Inside Control Area	Outside Control Area	Total	
Maine	All by Temp. Employees	14,676	15,195	29,871	-	23,607	23,607	162
N. H.	"	84,221	22,561	106,782	63,828	112,784	176,612	868
Vt.	Dist. Leaders	-	104	104	16,162	3,082	19,244	37
	Temp. Employees	2,412	2,127	4,539	27,711	49,324	77,035	129
	Total	2,412	2,231	4,643	43,873	52,406	96,279	166
Mass.	Dist. Leaders	772	13,969	14,741	10,151	2,655	12,806	16
	Temp. Employees	7,989	16,015	24,004	9,444	48,213	57,657	91
	Total	8,761	29,984	38,745	19,595	50,868	70,463	107
N. I.	All by Temp. Employees	-	19,949	19,949	3,334	23,277	26,611	202
Conn.	"	-	66,767	66,767	71,390	36,752	108,142	312
N. Y.	Dist. Leaders	750	30	780	5,695	9,190	14,885	16
	Temp. Employees	84,646	45,380	130,026	358,525	455,423	813,948	2,608
	Total	85,396	45,410	130,806	364,220	464,613	828,833	2,623
Penna.	All by Temp. Employees	2,706	51,474	54,179	75,757	13,381	89,138	156
All States	Dist. Leaders	1,522	14,103	15,625	32,008	14,927	46,935	68
	Temp. Employees	196,649	239,468	436,117	609,989	762,761	1,372,750	4,527
	Total	198,171	253,571	451,742	641,997	777,688	1,419,685	4,595

RIBES ERADICATION WORK ON STATE AND PRIVATELY-OWNED LANDS DURING 1948

Weather Conditions

Our phenologist, State Leader Perry of Massachusetts, reported that the season at the beginning of May was about ten days ahead of the late spring of 1947 with foliage conditions about average for a fifteen-year period. He also reported that rain fell on 24 days during May with a record of 5.37 inches compared with a normal of 3.18 inches, the wettest May since 1901 as recorded by the Boston office of the U. S. Weather Bureau. June was also wet with rain on 17 days, including six thunderstorms. The weather during the remaining three months of the 1948 ribes eradication season was unusually good for field work, except for three short periods of extreme heat with high humidity in July and August. The first killing frosts were reported on the morning of September 17.

Labor Conditions

The exceptionally wet weather during May and part of June not only handicapped the field work but resulted in a disturbing labor turn-over in several of the districts. However, personnel quotas were filled in practically all of the districts by the middle of June when the services of many high school boys became available. One noteworthy exception was in Massachusetts where great difficulty was encountered in filling the small quota of laborers paid from state funds. It was necessary to hire 31 different men to maintain a quota of only 14 jobs, and only two of the 31 men employed remained in service for the entire field season. This situation was due primarily to unfavorable working conditions resulting from inclement weather, low state wage rate, and delays in the dispatch of state pay checks over which our leaders had no control. On the whole, the procurement of labor presented no serious problems in most states. For example, District Leader DeBerti, of Pennsylvania, reported that for the first time in many years he was able to obtain all of his seasonal personnel without any assistance from the Employment Service.

Wage Rates for Temporary Federal Personnel

The Bureau approved the following hourly wage rates effective April 4, 1948 for temporary employees paid Federal L/A funds in this region: 88 cents for crew men, 98 cents for crew leaders, and \$1.10 for scouts and foremen. These new rates represented an increase of eight cents per hour for crew men and crew leaders, and ten cents per hour for scouts and foremen. As a basis for our recommendations to the Bureau on 1948 wage rates, data were obtained from each state on the prevailing rates per hour for laborers and foremen on work comparable to blister rust control. The sources of information included state employment services, employment agencies, state, county, town and local officials, etc. Due to the fact that our L/A employees are not paid for time lost due to inclement weather, the average "take home" pay for crew workers did not average more than \$30 per week.

Temporary Personnel Employed on Ribes Eradication Work During 1948

A maximum of 700 temporary workers were employed by all agencies on ribes eradication work under Project BLR-3-1 during the 1948 season as compared with 906 in 1947 and 983 during 1946. These numbers represent peak employment during a single biweekly period. The sharp decrease in 1948 was primarily due to the drastic cut in Federal 73.14 L/A funds effective July 1, 1947. The maximum employment figure indicated above for the 1947 season was based on the last payroll period in June when a considerable amount of federal money was available for control work. The decrease in federal funds is further emphasized by the fact that a total of only 397 laborers were paid from this source in 1948 as compared with 945 during the 1947 season and 1260 in 1946. The maximum number of federal workers during a single pay period in 1948 was only 273 as compared with 663 the previous season.

Table 9 - Temporary Personnel Employed on Ribes Eradication Work in 1948

(Work on State and Private Lands Only)

State	Maximum Number of Crew Men, Crew Leaders, Scouts and Foremen Employed by All Cooperating Agencies	Employees Paid from Federal 73.14 L/A Funds		
		Maximum Number*	Total Number**	Period of Peak Employment
Maine	67	30	36	July 25-August 7
N. H.	173	73	136	June 13-26
Vt.	42	32	47	Aug. 8-Sept. 4
Mass.	38	18	22	July 11-24
R. I.	3	1	1	Entire season
Conn.	32	16	18	August 8-21
N. Y.	271	83	115	July 11-24
Penna.	74	21	23	June 27-July 10
All States	700	273	397	-

*Peak employment during a single biweekly period.

**Regardless of length of time employed.

Results of 1948 Ribes Eradication Work on State and Private Lands

A total of 967,418 acres of state and privately-owned lands were cleared of 3,555,999 wild and cultivated ribes during 1948 as a result of 41,798 man-days labor. About one-third of the total acreage worked was in New York, which also accounted for 48.8% of the total ribes destroyed, 45.3% of the effective man days spent on such activities and 47.5% of the total expenditures for Project BLR-3-1. Maine and New Hampshire had 17.1% and 16.4%, respectively, of the total acreage worked in the region, while such percentages in the other states ranged from 1.5% in Rhode Island to 14.1% in Pennsylvania.

A special effort was made to complete areas in need of initial work, but such action is not always possible, especially in those states where the program location is chiefly dependent on town cooperation. Initial work was performed on 206,515 acres, or 21.3% of the total acreage covered on state and private lands. First workings comprised nearly 62% of the total acreage cleared of ribes in Vermont where the initial work is far behind schedule. In the other five states where the initial control work is not completed, such percentages ranged from 8.4% in Pennsylvania to 35.1% in Massachusetts.

It is significant that the total acreage worked on state and private lands during 1948 was slightly higher (7,125 acres) than in 1947 even though there was a decrease of over 24% in total man days expended on such activities. This was chiefly due to greater use of scouts and small crew units which resulted in commendable increases in production rates for all classes of work this year. Based on regional totals, there was an increase of 32.8% in acres worked per man day during 1948 over 1947.

The following table summarizes the results of all 1948 ribes eradication work on state and privately-owned lands by states and classes of work.

Table 10 - Ribes Eradication Work on State and Private Lands During 1948

First Work

State	Total Acreage Worked	% Total for Each State	Average Acreage Worked Per District in Each State	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
				Wild & Cult.	Cult. Only		Ribes	Man. Days	
Maine	32,883	15.9	10,961	22,816	247	250	0.7	.008	131.5
N. H.	33,218	16.1	5,536	279,873	0	2,354	8.4	.07	14.1
Vt.	43,767	21.2	14,589	141,900	74	1,479	3.2	.03	29.6
Mass.	17,455	8.5	8,727	34,736	128	821	2.0	.05	21.3
N. Y.	67,767	32.8	8,471	861,804	1,092	6,942	12.7	.10	9.8
Penna.	11,425	5.5	3,808	43,757	244	607	3.8	.05	18.8
All States	206,515	100.0	8,261	1,384,886	1,785	12,453	6.7	.06	16.6

Second Work

Maine	77,513	18.9	25,838	202,732	2,082	1,702	2.6	.02	45.5
N. H.	95,085	23.2	15,847	406,439	213	5,065	4.3	.05	18.8
Vt.	20,031	4.9	6,677	64,936	0	697	3.2	.03	28.7
Mass.	29,532	7.2	14,766	63,862	720	1,570	2.2	.05	18.8
N. Y.	101,366	24.7	12,671	564,521	96	6,404	5.6	.06	15.8
Penna.	86,541	21.1	28,847	269,480	866	3,736	3.1	.04	23.2
All States	410,068	100.0	16,403	1,571,970	3,977	19,174	3.8	.05	21.4

Other Workings

Maine	55,204	15.7	18,401	75,415	134	365	1.4	.02	63.8
N. H.	30,321	8.6	5,054	78,066	0	1,077	2.6	.04	28.2
Vt.	6,993	2.0	2,331	22,984	0	251	3.5	.04	27.9
Mass.	2,725	0.8	1,363	3,570	0	234	1.3	.09	11.8
R. I.	14,732	4.2	14,732	1,314	0	188	0.1	.01	78.4
Conn.	59,047	16.8	29,524	70,442	0	1,047	1.2	.02	56.4
N. Y.	143,378	40.9	17,922	308,988	84	5,583	2.2	.04	25.7
Penna.	38,435	11.0	12,812	38,364	56	926	1.0	.02	41.5
All States	350,835	100.0	12,530	599,143	274	10,171	1.7	.03	34.5

Table 10 (Continued) - Ribes Eradication Work on State and Private Lands During 1940

All Work

State	Total Acreage Worked	% Total for Each State	Average Acreage Worked Per District in Each State	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
				Wild & Cult.	Cult Only		Ribes	Man Days	
Maine	165,600	17.1	55,200	300,963	2,463	2,817	1.8	.02	58.6
N. H.	158,624	16.4	26,437	764,378	213	8,496	4.8	.05	18.7
Vt.	70,791	7.3	23,597	229,820	74	2,427	3.2	.03	89.8
Mass.	49,712	5.2	24,856	102,168	848	2,625	2.1	.06	18.9
R. I.	14,732	1.5	14,732	1,314	0	188	0.1	.01	70.4
Conn.	59,047	6.1	29,524	70,442	0	1,047	1.2	.02	66.4
N. Y.	312,511	32.3	39,064	1,735,313	1,272	18,929	5.6	.08	16.2
Penna.	136,401	14.1	45,467	351,601	1,166	5,269	2.6	.04	50.9
All States	967,418	100.0	34,551	3,555,999	6,036	41,798	3.7	.04	28.1

Based on regional totals, an average of 6.7 ribes per acre were destroyed on first workings, 3.8 bushes per acre on second work, and only 1.7 bushes per acre on other workings, while the production rates were as follows: first work - 16.6 acres per man day, second work - 21.4 acres per man day, and other workings - 34.5 acres. Similar relative values prevailed in New Hampshire, New York and Pennsylvania. In Maine, the averages for the initial work were greatly influenced by the results of scout work in one town where 23,372 acres were covered in ten man days by two scouts who located and destroyed only 359 ribes. This township is located in the sandy plain region along the Saco River Valley. Excluding the scout work in this township, the averages for first work in Maine would be 2.1 ribes per acre and 43.8 acres worked per man day, while the regional averages for first work would be changed to 7.5 ribes per acre and 14.8 acres per man day. In Vermont, there was very little difference in such values for the three classes of work, while in Massachusetts the ribes per acre averages were approximately the same for all classes of work. However, the Massachusetts production rates were in converse order in relation to the regional averages, the average for initial work being nearly double that for other workings.

The extremely low per acre figures for ribes in all states (high of 12.7 bushes per acre on first work in New York) are misleading, as portions of the areas contained considerable numbers of bushes. Where ribes are few and localized, scouting methods were used, but crew work was necessary where ribes occurred generally distributed or in large concentrations.

Production rates ranged from a low of 9.8 acres per man day on first work in New York to a high of 78.4 acres per man day for other workings in Rhode Island with an average of 23.1 acres per man day for all work in the region. The average for all initial work in Maine was 131.5 acres, but by excluding the previously mentioned scout work in one town the average for that state would be 43.8 acres and 22.6 acres per man day for all work in the region. A more detailed analysis of the production rates is given on Page 33 under the heading "Comparison of Production Rates For 1947 and 1948."

An average of 34,551 acres per district were worked during 1948 as compared with 33,114 the previous year when one additional district leader was employed. A large volume of scout work was responsible for the high averages of 55,200 acres in Maine and 45,467 acres per district in Pennsylvania. Although the average for New York was 39,064 acres, one district in that state had 89,880 acres, which was high for the region. A district in Pennsylvania ranked second with 88,822 acres, while a Maine district with 79,550 acres was in third place. In the other 25 districts the total acreages worked during 1948 ranged from a low of 5,686 to a high of 52,124 acres.

Annual and sick leave granted seasonal workers was not included in the man days charged to ribes eradication work during 1948 since the latter time should represent effective man days. Prior to this year, leave for seasonal workers was included and in 1947 it amounted to 7.4% of the total federal hours and 3.9% of the total time charged to ribes eradication. In other words, the production rates for the region would have been higher if the leave had been excluded in previous years. During the current year, such leave for Federal L/A workers during the ribes eradication season totalled 6,810 hours as compared with 17,409 hours in 1947. For the entire calendar year 1948 it amounted to 8,670 hours which was 12,800 hours, or 60%, less than the preceding year. At an average of 95 cents per hour, leave for temporary L/A workers cost \$8,236.50 in 1948.

Ribes Eradication Work on Maintenance Areas.

In 1946, provision was made for keeping separate records of the ribes eradication work on areas which had been previously placed on maintenance in this region. At that time, all of the control areas in Rhode Island and Connecticut were in that category as well as a large portion of the control area in Massachusetts. During the past three years, sizeable acreages have been placed on maintenance in most of the other states and at the end of 1948 nearly 36% of the entire control area in the region had been so classified.

Maintenance work was performed on 143,971 acres in six states during 1948, a total of 154,143 ribes being destroyed as a result of 2,957 man days labor. Accomplishments by states are summarized in the following table.

Table 11 - Maintenance Work on State and Private Lands During 1948

State	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
		Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	3,231	3,486	9	56	1.1	.02	57.7
Vt.	28	493	0	8	17.6	.29	3.5
R. I.	14,732	1,314	0	183	0.1	.01	78.4
Conn.	59,047	70,442	0	1,047	1.2	.02	56.4
N. Y.	39,434	60,387	16	1,268	1.5	.03	31.1
Penna.	27,449	18,021	52	390	0.7	.01	70.4
All States	143,971	154,143	77	2,957	1.1	.02	48.7

The results of the 1948 maintenance work are included under "Other Workings" in Table 10 of this report.

The 143,971 acres of maintenance work comprized 14.9% of all eradication work on state and private lands during 1948. In Rhode Island and Connecticut all work was on maintenance areas, and such work represented over 20% of the total in Pennsylvania. Only 28 acres of maintenance work was performed in Vermont, but this area had an average of 17.6 ribes per acre and the production rate was only 3.5 acres per man day. These values were out of line when compared with similar averages for the other states and this is a good example of a relatively few acres with higher than average ribes population causing distortion of results. In the other states, the ribes averaged from 0.1 to 1.5 per acre and the production rates ranged from 31.1 to 78.4 acres per man day. Most of the maintenance work was performed by scouts.

Comparison of Results of 1947 and 1948 Ribes Eradication Work

There was an increase of 0.7% in total acreage worked on state and private lands during 1948 as compared with 1947 in spite of a decrease of 24.4% in man days expended on such activities. Five of the eight states had increases in worked acreage, while decreases in man days employment occurred in all states except Connecticut. Only two states had increases in total number of ribes destroyed.

It is most significant that Pennsylvania had an increase of 113.5% in acreage with a decrease of 4.6% in man days; New Hampshire increased its acreage 46.7% with 9.7% less employment; Maine and Vermont had small increases in acreage with reductions of 55.6% and 44.6%, respectively, in man days; Connecticut more than doubled its 1947 production, but also had an increase of 20.6% in employment; while in Massachusetts and Rhode Island the percentages for acreage decreases were less than those for effective man days. Employment also dropped 22.2% in New York, but the 26.8% decrease in worked acreage was slightly higher. The following table gives detailed information on the 1947 and 1948 accomplishments in each state and shows the percentage of increase or decrease for the current year.

Table 12- Comparison of Results of 1947 and 1948 Ribes Eradication Work
on State and Private Lands

State	Total Acreage Worked			No. Ribes Destroyed			Man Days Employment		
	1947	1948	% Increase or Decrease in 1948	1947	1948	% Increase or Decrease in 1948	1947	1948	% Increase or Decrease in 1948
Maine	158,788	165,600	+ 4.3	530,205	300,963	-43.2	6,345	2,817	-55.6
N. H.	108,150	158,624	+ 46.7	566,555	764,378	+34.9	9,406	8,496	- 9.7
Vt.	69,690	70,791	+ 1.6	355,989	229,820	-35.4	4,381	2,427	-44.6
Mass.	72,063	49,712	- 31.0	209,151	102,168	-51.2	4,065	2,625	-35.4
R. I.	20,412	14,732	- 27.8	4,993	1,314	-73.7	415	188	-54.7
Conn.	28,302	59,047	+112.2	65,171	70,442	+ 8.1	868	1,047	+20.6
N. Y.	438,987	312,511	- 28.8	1,932,897	1,735,313	-10.2	24,321	18,929	-22.2
Penn.	63,900	136,401	+113.5	364,523	351,601	- 3.5	5,521	5,269	- 4.6
All States	960,292	967,418	+ 0.7	4,029,484	3,555,999	-11.7	55,322	41,798	-24.4

The production rates for all classes of work increased in 1948 compared with the previous year, and the average for all 1948 work was the highest ever attained in the region. On the other hand, the average number of ribes destroyed per acre set a new all-time low of 3.7 bushes as compared with a high of 31.2 ribes per acre for all work during 1936. This is to be expected since over 300 million ribes have been destroyed on the control project in this region since 1918, initial work has been completed on approximately 93% of the control area, and second work on 50%. Consequently, a large portion of the areas covered during recent years contained relatively few ribes and can be effectively worked by scouts and/or small crews. Greater use was made of such units during 1948, hence the increased production rates.

A comparison of the 1947 and 1948 production rates for all work by states shows increases in all states except New York which had a decrease of 9.4%. This may be attributed in part to an increase of 27.3% in ribes per acre - 5.6 bushes in 1948 as compared with 4.4 in 1947. The average number of ribes destroyed per acre in all the other states decreased in 1948 compared with the previous year. Maine and Pennsylvania more than doubled their production rates in 1948, a large volume of scout work being performed in both of these states. Increases of from 59.3% to 83.6% also occurred in Rhode Island, New Hampshire, Connecticut, and Vermont. Although Massachusetts had an increase of 6.8% for all work, the production rate for "Other Workings" in this state dropped 18.9%. On a percentage basis, the largest increases were for "Other Workings" in New Hampshire - 193.7% and Pennsylvania - 184.2%. The following table gives detailed information on the production rates for each class of work, by states, during 1947 and 1948.

Table 13 - Comparison of Production Rates For 1947 and 1948
(Acres Worked Per Man Day)

State	First Work			Second Work			Other Work			All Work		
	1947	1948	% Increase in 1948	1947	1948	% Increase or Decrease in 1948	1947	1948	% Increase or Decrease in 1948	1947	1948	% Increase or Decrease in 1948
Ala.	24.3	43.8	+ 80.2	23.6	45.5	+92.8	38.4	63.8	+ 66.1	25.0	50.7	+102.8
Ariz.	9.6	14.1	+ 46.9	13.0	18.8	+44.6	9.6	28.2	+193.7	11.5	18.7	+ 62.6
Cal.	15.6	29.6	+ 89.7	16.5	28.7	+73.9	14.2	27.9	+ 96.5	15.9	29.2	+ 83.6
Conn.	20.6	21.3	+ 3.4	16.7	18.8	+12.6	14.3	11.6	-18.9	17.7	18.9	+ 6.8
Del.	-	-	-	34.1	-	-	58.0	78.4	+ 35.2	49.2	78.4	+ 59.3
Fla.	-	-	-	46.0	-	-	32.5	56.4	+ 73.5	32.6	56.4	+ 73.0
Ill.	9.8	9.8	Same	20.2	15.8	-21.8	25.3	25.7	+ 1.6	18.0	16.5	- 8.3
Ind.	9.2	18.8	+104.3	13.2	23.2	+75.8	14.6	41.5	+184.2	11.6	25.9	+123.3
Iowa	12.0	14.8	+ 23.3	18.4	21.4	+16.3	23.8	34.5	+ 45.0	17.4	22.6	+ 29.9

*Excluding scout work on 23,372 acres in one township where only 359 ribes were located and destroyed as a result of 10 man days scout work.

Checking of 1948 Ribes Eradication Work

There were no changes during 1948 in the methods of checking the efficiency of the ribes eradication work in this region, such methods being described in detail on Page 32 of our 1947 annual report. However, there was a change in procedure for summarizing and analyzing the results of the measured general checks by supervisory personnel. Prior to this year, reports of such checking work were forwarded to the regional office weekly where they were summarized on a semi-monthly or monthly basis, and copies of the summaries furnished the respective state and district leaders. During the 1948 season, all measured general checking reports were sent direct from the field to the state leaders' offices for summary and analysis. This gave each state leader the opportunity to follow checking results closely and take any corrective action deemed necessary within a few days after the check was made. Most of the state leaders summarized these check data on a monthly basis and furnished the regional office with copies of the summaries.

Most of the measured general checking work is performed by the district leaders, but experienced supervisory foremen have been assigned to such activities, especially in New York, where the number and distribution of the crews made it essential that the district leaders have assistance on the checking work.

The district leaders and their assistants spent 3,597 $\frac{3}{4}$ hours making 2,051 checks in worked areas during 1948. A total of 9,003 ribes with 27,008 feet of live stem were found on the 3,187.73 acres covered by the checks, or an average of 2.8 bushes with 8.5 feet of live stem per acre. Table 13 summarizes the results of the 1948 checking by states and gives an analysis of the data on the basis of averages per district.

Table 14 - Results of Measured General Checks of 1948 Ribes Eradication Work

State	No. Checks	Hours Checking	Acres in Strip Checks	Ribes Found on Checks		Ribes Live Stem Found on Checks		Control Work	
				Total No.	Ave. Per Acre	Total F.L.S.	F.L.S. Per Acre	Approved	Disapproved
Maine	26	30	21.0	149	7.1	299	14.2	25	1
N.H.	218	287 $\frac{1}{2}$	172.05	523	3.0	1,029 $\frac{1}{2}$	6.0	214	4
Vt.	172	202	198.0	722	3.6	2,185	11.0	166	6
Mass.	113	88 $\frac{1}{2}$	88.75	316	3.6	788 $\frac{1}{2}$	8.9	111	2
R.I.	16	31 $\frac{1}{2}$	16.52	48	2.9	272 $\frac{1}{2}$	16.5	13	3
Conn.	94	242 $\frac{1}{2}$	169.25	465	2.7	3,750 $\frac{1}{2}$	22.2	81	13
N.Y.	1,253	2,576	2,413.0	6,148	2.5	17,038	7.1	1,190	63
Penn.	159	140	109.16	632	5.8	1,645	15.1	137	22
All States	2,051	3,597 $\frac{3}{4}$	3,187.73	9,003	2.8	27,008	8.5	1,937	114

Analysis

State	No. Districts	Averages Per District				% Total Acreage Worked During 1948 Covered By Measured General Checks	% Areas Checked Which Were Approved
		Acreage Cleared of Ribes*	No. Measured General Checks	Hours on Measured General Checks	Acreage of Measured General Checks		
Maine	3	55,200	8.7	10.0	7.0	0.01	96.2
N.H.	6	26,561	36.3	47.9	28.7	0.11	98.2
Vt.	3	23,597	57.3	67.3	66.0	0.28	96.5
Mass.	2	24,856	56.5	44.2	44.4	0.18	98.2
R.I.	1	14,732	16.0	31.5	16.5	0.11	81.2
Conn.	2	29,524	47.0	121.2	84.6	0.29	86.2
N.Y.	8	39,064	156.6	322.0	301.6	0.77	95.0
Penn.	3	45,467	53.0	46.7	36.4	0.08	86.2
All States	28	34,577	73.3	128.5	113.8	0.33	94.4

*Based on total acreage cleared of ribes in each state including work on federal lands.

The total of 2,051 measured general checks during 1948 was 84% less than that for the preceding year, but the volume of checking did increase slightly in three states - New Hampshire, Connecticut and Pennsylvania. Over 61% of all such checks in 1948 were in New York, which was the only state to approach the arbitrary goal of 1% of the total acreage worked. However, 80% of the 1948 checking work in this state was performed by supervisory foremen. In some of the other states, especially Maine, greater emphasis has been placed during recent years on supervisory inspections of the crews at work. Few measured general checks are feasible in sections such as southern New England where the ribes populations are generally low and most of the work is performed by the scouting method. A high percentage of the 1948 work in Maine and Pennsylvania was also performed by scouts. Compared with the previous year, there was a decrease of 30% in total time spent on measured general checking work in all states during 1948 as well as a decrease of 27.1% in acreage checked. The average number of bushes per acre (2.8) found on all such checks was exactly the same as in 1947, but the average live stem per acre increased from 7.1 to 8.5 feet. The 1948 live stem averages ranged from 6.0 in New Hampshire to 22.2 feet in Connecticut. This high average in Connecticut was primarily due to the results of a relatively few checks in areas where the work was disapproved. A total of 94 checks were made in this state and five of these checks had 52.5% of the total live stem. All five of these checks were in the Litchfield County district where occasional areas with heavy ribes populations are encountered.

The control work was disapproved on 5.6% of all the areas where measured general checks were made during 1948 as compared with 4.6% in 1947. Although only 3 areas were disapproved in Rhode Island, they represented 18.2% of the total number checked. Such checking in Rhode Island is restricted to the relatively few areas with ribes concentrations. The checks in disapproved areas comprised 13.8% of the totals in both Connecticut and Pennsylvania, but in the other five states, such percentages were very low, ranging from 1.8% in New Hampshire to 5.0% in New York.

The 1948 checking summaries submitted to the regional office did not contain detailed data in all instances, hence it was not possible to compile information on the average live stem per acre found on checks in disapproved areas for all states.

Transportation of Workers

The purchase of 32 new half ton pick-up trucks from federal funds during the fall of 1947 greatly alleviated the transportation problem which had existed in this region for several years. In addition to this new equipment, 33 old federal trucks were used to transport workers during the 1948 ribes eradication season while several state and county-owned vehicles were also available in New York. Only four federal L/A employees were authorized to use their personally-owned cars on a mileage basis.

During the early part of the fiscal year 1949, two additional new half ton pick-up trucks were ordered for this region and these machines were delivered in January, 1949. Five of the 33 old federal trucks were sold during the first quarter of 1949. Consequently, there will be a total of 62 federal trucks available for transporting workers during the 1949 season. Of the remaining

28 old trucks, 14 are of 1935 manufacture, six are 1936 models, and the remaining eight were made in 1938. Only two of these 28 old trucks had been operated over 100,000 miles up to the end of 1948, six had been driven from 75,000 to 99,999 miles, 15 from 50,000 to 74,999 miles, and the other five from 35,675 to 46,367 miles. However, the relatively low mileages for many of these old trucks is no indication of their true condition, since they have been used chiefly on rough rural roads and some of them apparently had hard usage before being transferred to our Division, especially the 1939 Plymouths obtained from the Division of Grasshopper Control. Action should be taken to replace many of these old trucks as soon as funds are available.

Authorization was granted for the purchase of 14 new passenger cars from federal funds in this region during the fiscal year 1949 and all of these new machines were delivered by January 25, 1949. All but 9 of the 33 federally-owned passenger cars now on hand are post-war models. The nine old cars include one 1940 model, four which were manufactured in 1941, and four in 1942. All of these machines had been driven from 57,456 to 96,954 miles up to the end of 1948. It will be necessary to replace a few of these old passenger cars in the near future, but no new car purchases are planned during the fiscal year 1950.

Injuries to Temporary Federal L/A Employees

A total of 397 temporary workers were employed for 15,171 man days on federal L/A funds in this region during the calendar year 1948. Only ten, or 2.5%, of these employees sustained injuries which necessitated medical services. No time was lost by three of these injured employees, while the other seven were disabled for a total of 91 working days. Of this total, 64 working days were lost by one employee in Connecticut who developed a hernia caused by a strain sustained while lifting a bag of sand ballast into a government truck. The Bureau of Employees' Compensation approved an operation for this employee, but he was reluctant to have it performed until four months after the date of the injury. Time lost by the other six injured employees ranged from one to eleven days. The 91 work days lost by all injured employees represented 0.6% of the total man days of temporary federal L/A employment, as compared with only 0.16% the previous year and 0.66% in 1946.

The following tabulation lists the number and types of injuries during 1948 by states:

<u>State</u>	<u>Total No. Injuries</u>	<u>Types of Injuries</u>			
		<u>Ivy or Oak Poisoning</u>	<u>Sprains & Bruises</u>	<u>Hernia</u>	<u>Lacerations & Fractures</u>
Maine	1	-	1	-	-
N. H.	2	2	-	-	-
Vt.	1	1	-	-	-
Conn.	1	-	-	1	-
N. Y.	5	2	2	-	1
Total	10	5	3	1	1

In addition to the injuries listed above, District Leader Simmonds, of Pennsylvania, sustained a severe sprain and fracture of his right ankle while working in the field with one of his crews on August 10th. As a result of this injury, he was disabled for nearly a month.

State Compensation For Cultivated Ribes Destroyed During 1948

For the first time in four years, one of the states paid a small amount of compensation for cultivated ribes destroyed during 1948. In New York, one owner was paid \$3.00 for two bushes. A total of 6,036 cultivated ribes were destroyed in all states in 1948. Table 40 in the Appendix lists information on cultivated ribes compensation for all years.

Nursery Sanitation Work During 1948

At present, sanitation zones totalling 12,899 acres are being maintained around 28 nurseries - 18 state, 9 private, and one federal. Sanitation work during 1948 was restricted to Connecticut and New York where 73 man days were spent examining the environs of 8 nurseries. Only 277 ribes were located and destroyed on the 4,697 acres covered. The 8 nurseries had a total of 63,575,000 white pine seedlings and transplants.

The following table summarizes the results of the 1948 nursery sanitation work by states, while Tables 33 to 35 in the Appendix show the accumulative accomplishments and the present status of such activities.

Table 15 - Nursery Sanitation Work During 1948

State	No. Nurseries Worked	Est. No. White Pines in Nurseries Worked	Acreage Worked	No. Ribes Destroyed	Total Man Days	No. Ribes Per Acre	Acres Worked Per Man Day
Conn.	3	1,700,000	1,036	0	4	0	259.0
N.Y.	5	61,875,000	3,661	277	69	0.08	53.1
Totals	8	63,575,000	4,697	277	73	0.06	64.3

Blister Rust Canker Elimination Work During 1948

Two of the New York district leaders gave technical supervision for blister rust canker elimination work on state and municipally-owned lands during the early spring and fall of 1948. The areas treated included state-owned white pine plantations in the township of Hardenburg, N.Y., similar plantations on the New York City watershed properties (Ashokan reservoir) in Harlex N.Y., and valuable esthetic pines on the state campsite at Wells, N.Y. A total of 21,263 white pines were examined and 2,331 fatally infected trees cut down. In addition, 8,322 blister rust cankers were removed from 3,066 other infected pines. A total of 227 man days were spent on these projects in New York. It is interesting to note that 25% of all the pines in the areas treated were infected.

Tables 38 and 39 in the Appendix show the accumulative results of blister rust canker elimination work by states and land ownership classes.

Status of Control Work on State and Privately-Owned lands

The present net control area on state and private lands comprises 11,577,059 acres, of which 4,084,359 acres support white pine meeting minimum stocking requirements for blister rust control. Nearly 75% of the control area has been detailed mapped, but many of the maps were made back in the days of the Emergency Programs and now need correction due to the innumerable changes in forest types caused by the hurricanes in New England and extensive logging operations in all states during the past ten years. Initial control work has been completed on 92.7% of the control area, nearly half of it has been worked twice, 11.2% three times, and 35.6% has been placed on maintenance including the entire control areas in Rhode Island, Connecticut and New Jersey. There was a net increase during 1948 of approximately 450,000 acres in maintenance acreage. The 4,123,858 acres in this category at the end of 1948 represents a net increase of 1,704,725 acres since 1943 or an average of 340,945 acres per year.

The total control area on state and private lands in this region has been reduced from 12,678,954 acres in 1943 to 11,577,059 acres at the end of 1948, a reduction of 1,101,895 acres in five years. During this same period, the total acreage of white pine in the control area dropped only 171,479 acres. The decrease in control area amounted to 8.7% as compared with 4.0% in the white pine acreage. The following table shows the current status of control work in each of the states.

Table 16 - Status of Blister Rust Control Work on State and Private Lands
(December 31, 1948)

State	Total Acreage of Net Control Area	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked			Acreage on Maintenance	Percentage of Net Control Area			
				Once	Twice	Three Times		Detail Mapped	Worked Once	Worked Twice	On Maintenance
Ala.	2,459,813	966,629	2,160,889	2,238,116	1,200,663	118,392	707,558	87.6	91.0	48.8	28
Ariz.	2,912,606	1,299,504	1,543,220	2,775,381	1,052,573	107,156	567,940	53.0	95.3	34.4	19
Cal.	715,635	158,044	698,308	534,326	232,534	26,803	174,678	97.6	74.7	32.5	24
Conn.	1,594,873	583,377	1,032,291	1,567,342	1,056,566	125,357	1,005,032	64.7	98.3	66.2	63
Del.	135,925	60,156	121,521	135,925	130,111	54,592	135,925	89.4	100.0	95.7	100
Fla.	453,177	86,431	453,177	453,177	305,319	189,132	453,177	100.0	100.0	67.4	100
Ill.	2,606,728	792,056	2,001,923	2,413,423	1,552,060	623,848	808,505	76.8	92.6	59.5	31
Ind.	16,742	3,771	0	16,742	1,417	0	16,742	0	100.0	8.5	100
Iowa	681,560	134,391	637,831	594,807	249,024	50,791	254,301	93.6	87.3	36.5	37
Maine	11,577,059	4,084,359	8,649,160	10,729,239	5,780,267	1,296,071	4,123,858	74.7	92.7	49.9	35

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Compared with 1947 totals, there was a net reduction of 321,717 acres in the control area and 54,383 acres in the white pine acreage during 1948. The largest decreases were in New York which had net reductions of 226,615 acres in control area and 34,852 acres in white pine acreage. Most of this discontinued acreage in New York was in the western part of the state, outside the present districts, where the pine consists chiefly of scattered woodlots and plantations. The state leader made a general survey of the control areas in several of the western New York counties during the early part of 1948 and in October an experienced state foreman was assigned to this section of the state. As a result of their efforts, 168,721 acres were discontinued from the control area in 1948 and a further reduction is expected during 1949. Sizeable acreages were also discontinued from the control areas in New Hampshire, Massachusetts and Pennsylvania. On the other hand, small increases occurred in Maine, Vermont and Rhode Island. A considerable portion of the areas discontinued during 1948 had been worked at least once previously. This is indicated by the fact that although 206,515 acres of initial work was performed on state and private lands during the current year, the total net acreage that had been worked once at the end of the year was only 21,054 acres more than the accumulative total at the end of 1947. Commendable progress has been made during the past two years towards completing the initial control work in Vermont and Pennsylvania, such work being behind schedule in both states. In Vermont, the percentage of initial work completed increased from 63.8% to 74.7%, while Pennsylvania jumped from 80.3% to 87.3%. In the latter state, the percentage of the control area on maintenance was increased from 22.6% in 1947 to 37.3% at the end of 1948.

In 1945 a post-war program of control work for the region was developed. The objective was completion within 5 years of all first working and the reworkings necessary to put most of the control area on maintenance, as well as to maintain control in Connecticut, Rhode Island and New Jersey where all pre-maintenance work had been completed. Although a fair start was made under this program with the increased federal and cooperative funds available in 1946 and 1947, it was not possible to attain the full program level. A further handicap developed with the drastic cut in federal funds for 1948. Large increases in cooperative funds have been a boon to the work, particularly in New York and Pennsylvania, but the full amounts needed are not available in all states.

During 1948 an analysis was made of the control needs in each of the six states in which pre-maintenance work remains. A program was outlined for each in which the objective is completion of the work necessary to put the total control area on maintenance. From four to eight years will be required to complete these programs depending on the work load involved. The success of each plan depends on increased funds, of which the chief need is for more federal money, and higher production rates from improved control methods.

Table 17 - Control Work Needed on State and Privately-Owned Lands
(As of December 31, 1948)

State	Total Acreage of Net Control Area	Acreage in Net Control Area in Need of			Percentage of Net Control Area in Need of		
		Initial Detail Mapping	First Work	Rework	Initial Detail Mapping	First Work	Rework
Maine	2,459,813	298,924	221,697	1,530,553	12.2	9.0	62.2
N.H.	2,912,606	1,369,386	137,225	2,207,441	47.0	4.7	75.8
Vt.	715,635	17,327	181,309	359,648	2.4	25.3	50.3
Mass.	1,594,873	562,582	27,531	562,310	35.3	1.7	35.3
R.I.	135,925	14,404	0	0	10.6	0	0
Conn.	453,177	0	0	0	0	0	0
N.Y.	2,606,728	604,805	193,305	1,604,918	23.2	7.4	61.6
N.J.	16,742	16,742	0	0	100.0	0	0
Penna.	681,560	43,729	86,753	340,506	6.4	12.7	50.0
All States	11,577,059	2,927,899	847,820	6,605,381	25.3	7.3	57.1

Although 92.7% of the initial ribes eradication work has been completed, approximately a quarter of the total control area on state and private lands is still in need of initial detail mapping. This is due to the fact that many areas were initially cleared of ribes before the present detail mapping procedure was adopted. During the early years of the control program the worked areas were designated on maps, but spot maps only were prepared to show the location of pine areas. Nearly 87% of the remaining initial mapping work is in New Hampshire, Massachusetts and New York. New Hampshire alone has 1,369,386 acres, which is 46.8% of the total for the region. Accurate information is not available on the amount of remapping needed, but many of the detail maps prepared 10-15 years ago need revision due to the innumerable changes in the forest types chiefly as a result of hurricane damage and extensive logging operations. In fact, either initial detail mapping or correction of existing maps will be necessary for the 7,453,201 acres which were in need of initial or rework at the end of 1948. The use of aerial photographs has greatly facilitated control area mapping work during the past few years, but the mapping has not kept pace with the ribes eradication work as indicated by the fact that 1,036,145 acres were mapped during 1947 and 1948 while a total of 1,936,514 acres were cleared of ribes.

At the end of 1946, there were still 847,820 acres in need of initial control work and 6,605,381 additional acres which had been worked but not on maintenance. The following tabulation shows the length of time it would take to complete all of this work in each state at the average yearly rate of progress made during 1947 and 1948:

State	Acreage in Need of Work at End of 1946			Average Yearly Acreage Worked During 1947 and 1948	No. of Years Required To Complete All Work at Rate of Accomplishment During 1947 & 1948
	Initial	Rework	Total		
Maine	221,697	1,530,558	1,752,255	162,194	10.8
N.H.	137,225	2,207,441	2,344,666	133,387	17.6
Vt.	181,309	359,648	540,957	70,240	7.7
Mass.	27,531	562,310	589,841	60,887	9.7
N.Y.	193,305	1,604,918	1,798,223	375,749	4.8
Penna.	86,753	340,506	427,259	100,150	4.3
Total	847,820	6,605,381	7,453,201	902,607	8.3

The above analysis does not provide for any maintenance work, hence the length of time required to complete all necessary pre-maintenance work would be increased if maintenance work is conducted in conjunction with such activities. During the past two years, only 110,703 acres of maintenance work was performed on state and private lands in the six states listed above. The maintenance work even now is behind schedule in all of the above states and there are many areas in this category which have not been worked for 10-15 years. On the basis of accomplishments during the past two years, New York and Pennsylvania are the only ones in the above group which have had a program even approaching current needs.

Expenditures For Project BLR-3-1

State and local cooperative expenditures for Project BLR-3-1 during the calendar year 1948 totalled \$310,523.65, which was an increase of 15.9% over the preceding year. The following tabulation gives a comparison of these expenditures in each state during the past two years:

State	State and Local Cooperative Expenditures		% Increase or Decrease in 1948
	1947	1948	
Maine.....	\$15,134.59	\$15,477.19	+ 2.3
N.H.....	44,391.83	55,155.39	+24.2
Vt.....	7,479.03	7,345.10	- 1.8
Mass.....	14,580.43	13,336.14	- 8.5
R.I.....	4,778.02	1,716.52	-64.1
Conn.....	8,270.31	12,237.18	+48.0
N.Y.....	154,604.21	170,599.39	+10.3
Penna.....	18,679.90*	34,656.74	+85.5
Total.....	\$267,918.32	\$310,523.65	+15.9

*Total of \$65.60 state funds also spent on Allegheny National Forest project.

On a percentage basis, the largest increases during 1948 occurred in Pennsylvania, Connecticut and New Hampshire. There were small decreases in Vermont and Massachusetts. The large decrease in Rhode Island was due to the fact that a state-paid leader was not employed this year, the work being directed by District Leader Schreier, of Connecticut. The New York expenditure of \$170,599.39 represented 54.9% of the total cooperative funds for the region.

There was a decrease of 47.5% in federal expenditures for Project BLR-3-1 during the calendar year 1948 as compared with 1947. In fact, for the first time in years such federal expenditures did not equal or exceed direct aid furnished by the states and local cooperators. The biggest discrepancies in matching funds during 1948 occurred in New York, Pennsylvania and New Hampshire, where direct aid by the states and local cooperators exceeded federal expenditures by 229.7%, 125.3%, and 72.8%, respectively. On the other hand, federal expenditures in Vermont were 151.1% greater than the amount of direct aid furnished by the state and towns. A larger proportion of federal money was allotted to Vermont in order to have a balanced program. Of the total federal expenditures during the current year, 75.1% was used for wages of temporary L/A laborers, 18.3% for non-labor expenses, 4.0% for salaries of three district leaders, and 2.6% for new automotive equipment. The cost of the new cars and trucks ordered during the latter part of the year will be charged against the calendar year 1949 since some of these machines were not delivered until after January 1, 1949 and information was not available on the net cost of all such new equipment when the regional office books were closed for the current calendar year. The proportion of Federal 73.14 money used for non-labor expenses during 1948 was 18.3% as compared with 10.1% the previous year. This sizeable increase was due to the fact that the expenses of most of the state and district leaders were paid from such funds during the entire year in 1948 and only for six months in 1947.

The following table lists all expenditures and contributed services for Project BLR-3-1 during the calendar year 1948 by states.

Table 18 - Total Expenditures and Contributed Services For Work Project BLR-3-1 During Calendar Year 1948

State and Local Cooperative Expenditures and Contributed Services										
State	Cash Expenditures					Value of Contributed Services		Total	B.E.&P.Q. (73.14)	Grand Total
	State Funds	Towns	Counties	Indiv.	Sub--Total	State	Indiv. & Counties			
Maine	8,951.46	5,730.73	-	-	14,682.19	795.00	-	15,477.19	16,423.42	31,900.61
N.H.	11,863.99	41,163.52	-	-	53,027.51	2,127.88	-	55,155.39	31,922.79(3)	87,078.18
Vt.	340.97	5,937.55	-	76.65	6,355.17	989.93	-	7,345.10	18,446.03	25,791.15
Mass.	9,115.68	145.52	-	2,888.98	12,150.18	1,160.00	25.96(1)	13,336.14	11,948.52	25,284.66
R.I.	1,451.52	-	-	-	1,451.52	265.00	-	1,716.52	2,531.79	4,248.31
Conn.	8,860.77	1,168.48	-	746.75	10,776.00	1,461.18	-	12,237.18	9,343.72	21,580.90
N.Y.	142,126.15	-	16,088.52	274.80	158,489.47	11,134.92	975.00(2)	170,599.39	51,744.49	222,343.88
Penna.	33,696.74	-	-	-	33,696.74	960.00	-	34,656.74	15,383.77	50,040.51
All States	216,407.28	54,145.80	16,088.52	3,987.18	290,628.78	18,893.91	1000.96	310,523.65	157,744.53	468,268.18

(1) Individuals

(2) Counties

(3) Includes \$284.40 Federal L/A money allotted to Cambridge Office which was expended for wages of laborers in New Hampshire, but excludes \$37.31 Federal 73.14 L/A money spent on White Mountain National Forest project.

Recapitulation of B.E. and P.Q. Expenditures For Project BLR-3-1 During Calendar Year 1948

State	Salaries of Appointees	L/A Expenditures			Purchase Orders	Total
		Wages of Laborers	Non-Labor Expenses			
			Sub-Total			
Maine	-	11,749.98	3,780.09	15,530.07	893.35	16,423.42
N.H.	1,304.27	24,198.00	4,373.55	28,571.55	2,046.97	31,922.79
Vt.	-	13,999.72	3,268.26	17,267.98	1,178.05	18,446.03
Mass.	-	9,633.88	2,314.64	11,948.52	-	11,948.52
R. I.	771.42(1)	1,530.40	229.97	1,760.37	-	2,531.79
Conn.	2,314.25	4,976.72	2,052.75	7,029.47	-	9,343.72
N.Y.	1,938.72	41,335.96	8,469.81	49,805.77	-	51,744.49
Penna.	-	11,052.36	4,331.41	15,383.77	-	15,383.77
All States	6,328.66	118,477.02	28,820.48	147,297.50	4,118.37	157,744.53

(1) One-fourth of Schreier's total salary - remainder charged to Connecticut.

In addition to the Federal 73.14 expenditures listed for Massachusetts, \$5.60 was expended for wages of a temporary employee at Cambridge regional office.

PART IV

BLISTER RUST CONTROL WORK ON NATIONAL FORESTS IN NORTHEASTERN REGION

FINANCIAL PROJECT BLR-4

The Bureau of Entomology and Plant Quarantine is cooperating with the U.S. Forest Service in the control of white pine blister rust on the three national forests (White Mountain, Green Mountain and Allegheny) in the Northeastern Region. At the end of 1948, the net control area on these forests totalled 8,308 acres, of which 2,241 acres is in white pine. Initial control work has now been completed on all three forests and 72% of the control area has been classified as being on a maintenance basis.

Ribes Eradication Work During Calendar Year 1948

Control activities during 1948 were restricted to the White Mountain National Forest in New Hampshire where ten areas, aggregating 745 acres, in the Saco, Pemigewasset, Ammonoosuc and Androscoggin Districts were worked during June under the supervision of District Blister Rust Control Leaders Boomer and Codman. The following table summarizes the results of this work by block units.

Table 19 - Ribes Eradication Work on White Mountain National Forest-1948

Block Unit	Type of Work	Acreage Worked	No. Ribes Destroyed (all wild)	Total Man Days	Per Acre		Acres Worked Per Man Day
					Ribes	Man Days	
Albany #12	First	30	0	1	0	.03	30.0
Landaff #5	Second	60	1,604	9	26.7	.15	6.7
Stark #1	"	150	3,926	14	26.2	.09	10.7
Sub-Total	"	210	5,532	23	26.3	.11	9.1
Bartlett #7	Other	15	12	1	0.8	.07	15.0
Thornton #4	"	30	207	6	6.9	.20	5.0
Thornton #6	"	70	126	16	1.8	.23	4.4
Benton #3	"	60	150	7	2.5	.12	8.6
Benton #4	"	30	96	5	3.2	.17	6.0
Sub-Total	"	205	591	35	2.9	.17	5.9
Albany #5	Maint.	150	0	3	0	.02	50.0
Albany #11	"	150	0	1	0	.01	150.0
Sub-Total	"	300	0	4	0	.01	75.0
Totals	-	745	6,123	63	8.2	.08	11.8

A few additional units were tentatively scheduled for work during 1948 in connection with the 1947 reappraisal by the Forest Service of blister rust control needs on the White Mountain National Forest in light of wartime pine operations. However, a careful examination of these tracts in 1948 showed that the white pine did not meet minimum stocking requirements and they were discontinued from the control area. All necessary work was completed on this forest in 1948.

Expenditures During Calendar Year 1948

The wages of the laborers assigned to the control project on the White Mountain National Forest during June, 1948 were paid from B.E. and P.O. funds on a reimburseable basis. Bi-weekly payrolls were prepared at our Cambridge regional office and forwarded to the Boston Treasury Disbursing Office for payment.

Bureau trucks were used to transport the laborers, only the operating costs being charged against the project.

The Forest Service allotted a total of \$900. for blister rust control work on the White Mountain National Forest during the fiscal year 1948. Of this total \$91 was expended in August, 1947 leaving a balance of \$809.00 available for work during the spring of 1948. Actual expenditures were as follows:

<u>Item</u>	<u>Forest Service</u>	<u>B. E. & P. O.</u>	<u>Total</u>
Wages of laborers.....	\$473.72	0	\$473.72
Transportation expenses.....	0	\$37.31	37.31
Total.....	\$473.72	\$37.31	\$511.03

Status of Control Work on National Forests

The present net control areas on the three national forests in this region aggregate 8,308 acres. All of the initial control work has been completed and approximately 75% of the control areas have been worked twice. The entire control area on the Green Mountain National Forest is on a maintenance basis and 82.6% of the control area on the White Mountain National Forest has been so classified. Due to the heavy ribes populations encountered on several of the units on the Allegheny National Forest, only 54.8% of the control area is considered to be on a maintenance basis. The following table gives detailed information on the status of control work on each of the three forests.

Table 20 - Status of Ribes Eradication Work in Present Net Control Areas on National Forests
(December 31, 1948)

Forest	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Acreage Worked			Acreage Now on Maintenance Basis	Percentage of Net Control Area		
				First Work	Second Work	Other Workings		Worked Once	Worked Twice	On Net Control
White Mtn.	Maine	1,156	368	1,156	473	428	498	100.0	40.9	43.1
	N. H.	3,034	980	3,034	2,984	2,653	2,964	100.0	98.4	97.7
	Total	4,190	1,348	4,190	3,457	3,111	3,462	100.0	82.5	82.6
Green Mt.	573	89	513	573	115	-	573	100.0	20.1	100.0
Allegheny	3,545	804	3,545	3,545	2,690	1,314	1,943	100.0	75.9	54.8
Total	8,308	2,241	8,248	8,308	6,262	4,425	5,978	100.0	75.4	72.0

Future Control Work

No control work is deemed essential on any of the three national forests until the calendar year 1952. District Leader Becker's report on the results of the 1948 control work on White Mountain National Forest areas in New Hampshire recommended rework on 7 units comprising 457 acres during the period 1950-1954, inclusive. However, due to the small acreages scheduled for each year, it appears advisable to do all of the work in a single year, preferably 1952. Detailed recommendations will be submitted to the Forest Service in due time concerning control needed in 1952.

Table 21 - Ribes Eradication Work on National Forests, 1924-1942, Inclusive

Forest	Program	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Reported For Man Days
				Wild & Cult.	Cult. Only		Ribes	Man Days	
White Mountain	Regular	Initial	7,579	183,828	-	632	24.3	.063	12.0
		Rework	9,361	25,491	-	407	2.7	.043	23.0
		Total	16,940	209,319	-	1,039	12.4	.061	15.3
	C.C.C.	Initial	1,950	633,866	85	2,325	325.1	1.192	0.8
		Rework	3,799	309,521	-	1,700	81.5	.447	8.9
		Total	5,749	943,387	85	4,025	164.1	.700	1.9
	All	Initial	9,529	817,694	85	2,957	85.8	.310	3.8
		Rework	13,160	335,012	-	2,107	25.5	.160	6.2
		Total	22,689	1,152,706	85	5,064	50.8	.223	4.5
Green Mountain	All Regular	Initial	458	3,298	-	31	7.2	.068	14.8
		Rework	115	252	-	12	2.2	.104	9.4
		Total	573	3,550	-	43	6.2	.075	13.3
Allegheny	Regular	Initial	1,746	153,033	8	414	87.6	.237	4.8
		Rework	3,571	47,921	-	505	13.4	.141	1.3
		Total	5,317	200,954	8	919	37.8	.173	5.8
	C.C.C.	Initial	3,703	665,798	22	2,787	179.8	.753	4.3
		Rework	669	68,588	-	521	102.5	.779	4.3
		Total	4,372	734,386	22	3,308	168.0	.757	1.3
	All	Initial	5,449	818,831	30	3,201	150.3	.587	1.7
		Rework	4,240	116,509	-	1,026	27.5	.242	4.1
		Total	9,689	935,340	30	4,227	96.5	.435	2.3
Total	Regular	Initial	9,783	340,159	8	1,077	34.8	.110	8.1
		Rework	13,047	73,664	-	924	5.6	.071	14.1
		Total	22,830	413,823	8	2,001	18.1	.088	11.4
	C.C.C.	Initial	5,653	1,299,664	107	5,112	229.9	.904	1.1
		Rework	4,468	378,109	-	2,221	84.6	.497	2.0
		Total	10,121	1,677,773	107	7,333	165.8	.724	1.4
	All	Initial	15,436	1,639,823	115	6,189	106.2	.401	2.5
		Rework	17,515	451,773	-	3,145	25.8	.180	5.6
		Total	32,951	2,091,596	115	9,334	63.5	.283	3.5

In addition to the 458 acres of initial work listed for the Green Mountain National Forest, 115 acres on this forest were initially cleared of ribes in connection with work on state and privately-owned lands prior to acquisition by the Government. The gross acreages worked on the White Mountain and Allegheny National Forests are somewhat greater than the present net control areas on these forests due to the discontinuance of several units from the control areas during recent years.

Table 22 - Expenditures For Blister Rust Control on National Forests
1924-1948, Inclusive

Agency	White Mountain	Green Mountain	Allegheny	Total
Forest Service	\$4,661.32	\$292.65	\$3,909.77	\$8,863.74
B.E. and P.Q.	44.89	20.38	429.13	494.40
B.P.I.	75.63	-	207.85	283.48
State	357.61*	-	65.60**	423.21
C.C.C.	8,096.47	-	7,128.69	15,225.16
Total	\$13,235.92	\$313.03	\$11,741.04	\$25,289.99

*New Hampshire

**Pennsylvania

Costs listed in above table do not include any charges for supervisory activities of employees of Forest Service, Bureau of Plant Industry, and Bureau of Entomology and Plant Quarantine. The C.C.C. costs were computed on an arbitrary basis for the time the enlisted men actually spent on the project, actual cost of technical foremen, and estimated costs of transportation for the entire C.C.C. personnel assigned to the work.

PART V

BLISTER RUST CONTROL ON NATIONAL PARKS IN NORTHEASTERN REGION

FINANCIAL PROJECT BLR-5

During recent years, control activities in cooperation with the National Park Service in this region have been restricted to a project at Acadia National Park on Mount Desert Island in Maine. The disease was firmly established on this park at the time control operations were inaugurated in 1929, but field observations and special studies have indicated that the ribes eradication work since that time has been very effective in controlling the disease. In fact, the entire control area, comprising 16,872 acres, had been classified as being on maintenance by the end of 1945. Some maintenance work was performed in 1946 and 1947, but due to the small amount of ribes regrowth found on many of the areas, no further work was recommended until at least 1950.

The future blister rust control problem at Acadia National Park was greatly complicated by the devastating forest fire of October, 1947. This fire burned over nearly 16,000 acres of forest land on the Island, including 8,600 acres, or 51% of the control area on the park. These areas contained some of the most valuable white pine on the Island and it is doubtful if some of the areas will restock to this valuable species.

Recommendations For Future Control Work

Recommendations have been submitted to the Park Service officials that a systematic survey be made during the period May 15-August 31, 1950 of the burned areas as well as a check of some of the adjacent unburned areas to determine their status. Sufficient time will have elapsed by the spring of 1950 to permit pine and ribes regeneration to become established in the burned areas to provide an index of future pine stands and control problems involved. Our recommendations to the Park Service also included estimates of the costs of the proposed survey. As a preliminary to this survey, we plan to do some exploratory work late in 1949 with our permanent personnel.

It is very probable that additional ribes eradication work will be necessary on portions of the burned area, but the volume of such work and the amount of funds required for this phase will not be known until the survey is completed.

Status of Ribes Eradication Work at Acadia National Park

In our status of control records for the region, the entire control area of 16,872 acres on Acadia National Park is still being carried on maintenance. Undoubtedly some of the burned units will be discontinued from the control area, but it is not possible to make any accurate changes in the data until definite information has been obtained on pine and ribes regeneration in the burned areas. The status of control data for Acadia Park are as follows:

Total acreage of net control area.....16,872
 Estimated acreage of white pine in net control area..... 3,200
 (First work.....16,872
 Acreage worked (Second work.....16,872
 (Third work..... 8,207
 Acreage on maintenance.....16,872
 (Worked once..... 100.0
 Percentage of net control area (Worked twice..... 100.0
 (Worked three times..... 48.6
 (On maintenance..... 100.0

Table 23 - Ribes Eradication Work at Acadia National Park
1929-1948, Inclusive

Program	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Regular	First	7,726	503,920	-	2,798	65.2	.36	2.8
	Second	8,732	24,165	1	886	2.8	.10	9.9
	Third	8,207	6,100	1	656	0.7	.08	12.5
	Total	24,665	534,185	2	4,340	21.7	.18	5.7
C.C.C.	First	12,990	390,020	293	8,429	30.0	.65	1.5
	Second	9,427	35,191	-	3,564	3.7	.38	2.6
	Total	22,417	425,211	293	11,993	19.0	.53	1.9
All	First	20,716	893,940	293	11,227	43.2	.54	1.8
	Second	18,159	59,356	1	4,450	3.3	.25	4.1
	Third	8,207	6,100	1	656	0.7	.08	12.5
	Total	47,082	959,396	295	16,333	20.4	.35	2.9

Table 24 - Blister Rust Canker Elimination Work at Acadia National Park
(Work performed during period 1932-1939, inclusive, 1946, and 1947)

Program	Total No. Pines Examined	No. Infected Pines Cut Down	No. Infected Pines From Which Cankers Removed	No. Cankers Removed		Total Man Days
				Branch	Stem	
Regular	3,311	419	1,045	2,421	170	299
C.C.C.	58,261	2,957	8,879	27,054	2,691	2,177
All	61,572	3,376	9,924	29,475	2,861	2,476

Table 25 - Total Expenditures For Dipter Pest Control at Acadia National Park
1929-1946, Inclusive

Park Service	Bureau of Plant Industry	C.C.C.	Total
\$23,593.51	\$3,145.83	\$29,880.36	\$56,619.70

The costs for the control project at Acadia National Park do not include any charges for the supervisory activities of employees of the Park Service, Bureau of Plant Industry, and Bureau of Entomology and Plant Quarantine.

The C.C.C. costs were computed on the basis of arbitrary charges for the time enlisted men spent on the project, actual cost of technical foremen and checkers, and estimated costs of transportation for all C.C.C. personnel assigned to the project.

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Table 26 - Ribes Eradication Work During 1948 by States and Land Ownership ClassesFirst Work

State	Land Ownership Class	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Treated by April 1
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	All State & Private	32,883	22,816	247	250	0.7	.008	332.5
N. H.	State & Private	33,218	279,873	0	2,354	8.4	.07	14.1
	White Mt. Nat. Forest	30	0	0	1	0	.03	10.0
	Total	33,248	279,873	0	2,355	8.4	.07	14.1
Vt.	All State & Private	43,767	141,900	74	1,479	3.2	.03	24.3
Mass.	"	17,455	34,736	123	821	2.0	.05	21.3
N. Y.	"	67,767	861,804	1,092	6,942	12.7	.10	50.3
Penna.	"	11,425	43,757	244	607	3.8	.05	30.2
All States	State & Private	206,515	1,384,886	1,785	12,453	6.7	.06	16.3
	National Forest	30	0	0	1	0	.03	10.0
	Total	206,545	1,384,886	1,785	12,454	6.7	.06	16.3

Second Work

Maine	All State & Private	77,513	202,732	2,082	1,702	2.6	.02	45.5
N. H.	State & Private	95,085	406,439	213	5,065	4.3	.05	14.8
	White Mt. Nat. Forest	210	5,532	0	23	26.3	.11	3.1
	Total	95,295	411,971	213	5,088	4.3	.05	14.8
Vt.	All State & Private	20,031	64,936	0	697	3.2	.03	20.3
Mass.	"	29,532	63,862	720	1,570	2.2	.05	22.6
N. Y.	"	101,366	564,521	96	6,404	5.6	.06	19.2
Penna.	"	86,541	269,480	866	3,736	3.1	.04	23.2
All States	State & Private	410,068	1,571,970	3,977	19,174	3.8	.05	22.6
	National Forest	210	5,532	0	23	26.3	.11	3.1
	Total	410,278	1,577,502	3,977	19,197	3.8	.05	22.6

Table 26 (Continued) - Ribes Eradication Work During 1948 By States and Land Ownership ClassesThird and Other Workings

State	Land Ownership Class	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	All State & Private	55,204	75,415	134	865	1.4	.02	63.8
N. H.	State & Private	30,321	78,066	0	1,077	2.6	.04	28.2
	White Mt. Nat. Forest	505	591	0	39	1.2	.08	12.9
	Total	30,826	78,657	0	1,116	2.6	.04	27.6
Vt.	All State & Private	6,993	22,984	0	251	3.3	.04	27.9
Mass.	"	2,725	3,570	0	234	1.3	.09	11.6
N. I.	"	14,732	1,314	0	188	0.1	.01	78.4
Conn.	"	59,047	70,442	0	1,047	1.2	.02	56.4
N. Y.	"	143,378	308,988	84	5,583	2.2	.04	25.7
Penn.	"	38,435	38,364	56	926	1.0	.02	41.5
All States	State & Private	350,835	599,143	274	10,171	1.7	.03	34.5
	National Forest	505	591	0	39	1.2	.08	12.9
	Total	351,340	599,734	274	10,210	1.7	.03	34.4

All Work

Maine	All State & Private	165,600	300,963	2,463	2,817	1.8	.02	58.8
N. H.	State & Private	158,624	764,378	213	8,496	4.8	.05	18.7
	White Mt. Nat. Forest	745	6,123	0	63	8.2	.08	11.8
	Total	159,369	770,501	213	8,559	4.8	.05	18.6
Vt.	All State & Private	70,791	229,820	74	2,427	3.2	.03	29.2
Mass.	"	49,712	102,168	848	2,625	2.1	.05	18.9
N. I.	"	14,732	1,314	0	188	0.1	.01	78.4
Conn.	"	59,047	70,442	0	1,047	1.2	.02	56.4
N. Y.	"	312,511	1,735,313	1,272	18,929	5.6	.06	16.5
Penn.	"	136,401	351,601	1,166	5,259	2.6	.04	25.9
All States	State & Private	967,418	3,555,999	6,036	41,798	3.7	.04	23.1
	National Forest	745	6,123	0	63	8.2	.08	11.8
	Total	968,163	3,562,122	6,036	41,861	3.7	.04	23.1

Table 27 - Ribes Eradication Work on Maintenance Areas During 1948

State	Land Ownership Class	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acreage Worked Per Man Day
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Ala.	All State & Private	3,231	3,486	9	56	1.1	.02	57.4
Ariz.	White Mt. Nat. Forest	300	0	0	4	0	.01	75.0
Calif.	All State & Private	28	493	0	8	17.6	.29	3.2
Idaho	"	14,732	1,314	0	188	0.1	.01	78.4
Mont.	"	59,047	70,442	0	1,047	1.2	.02	56.4
Nev.	"	39,484	60,387	16	1,268	1.5	.03	31.1
Nm.	"	27,449	18,021	52	390	0.7	.01	70.4
All States	State & Private	143,971	154,143	77	2,957	1.1	.02	44.1
	National Forest	300	0	0	4	0	.01	75.0
	Total	144,271	154,143	77	2,961	1.1	.02	44.1

Maintenance workings are included under results of "Third and Other Workings" in Table 26 .

Table 28 - Total Expenditures For All Blister Rust Control Activities During Calendar Year 1948

State	Federal			States and Local Cooperators						Grand Total	
	B.R. and P.Q.		Forest Service	Total	States			Towns	Counties		Total
	71.14	73.14			Cash	Contributed Services	Indiv- iduals				
Maine	17,855.12	16,423.42	-	34,278.54	8,951.46	2,295.00	-	5,730.73	-	16,977.19	51,255.13
N. H.	25,739.90	31,675.70	473.72	57,889.32	11,863.99	2,427.88	-	41,163.52	-	55,455.39	113,344.71
Vt.	16,136.81	18,446.03	-	34,582.84	340.97	1,841.93	76.65	5,937.55	-	8,197.10	42,779.91
Mass.	13,930.84	11,948.52	-	25,879.36	9,115.68	1,160.00	2,914.94	145.52	-	13,336.14	39,215.50
R. I.	-	2,531.79	-	2,531.79	1,451.52	397.00	-	-	-	1,848.52	4,380.31
Conn.	5,154.79	9,343.72	-	14,498.51	8,860.77	2,394.52	746.75	1,168.48	-	13,170.52	27,669.03
N. Y.	31,811.82	51,744.49	-	83,556.31	42,126.15	14,134.92	274.80	-	17,063.52	173,599.39	257,155.70
Penna.	14,092.84	15,383.77	-	29,476.61	33,696.74	1,344.00	-	-	-	35,040.74	64,517.35
All States	124,722.12	157,497.44	473.72	282,693.28	216,407.28	25,995.25	4,013.14	54,145.80	17,063.52	317,624.99	600,318.21

Table 28 does not include \$45,833.44 Federal 71.14 and \$8.80 Federal 73.14 funds expended for Cambridge regional office.

Table 29 - Informational and Service Activities of Permanent and Temporary District Leaders During Period 1922-1948, Inclusive

Informational Activities

State	Meetings Addressed		Items Published	Displays Placed
	No.	Attendance		
Maine	1,414	38,612	643	1,143
N. H.	3,999	230,081	4,554	2,226
Vt.	1,145	41,161	707	965
Mass.	1,076	52,572	2,178	677
R. I.	277	20,666	408	135
Conn.	145	5,535	646	150
N. Y.	2,241	177,743	2,974	845
Penna.	37	3,648	52	68
All States	10,334	569,818	12,162	6,460

Service Activities

State	Initial Interviews	Follow-up Calls	Persons Instructed In M. 16
Maine	36,537	14,644	23,189
N. H.	42,742	43,239	24,360
Vt.	16,521	13,101	10,522
Mass.	38,717	13,588	12,668
R. I.	3,967	3,293	754
Conn.	6,007	3,950	1,895
N. Y.	40,092	30,083	22,234
Penna.	2,699	538	3,356
All States	187,282	122,436	104,976

Table 30 - Local Cooperation on Blister Rust Control Work - 1918 to 1943, Inclusive

Individual Cooperation

State	No. Cooperators		Amount Spent By Individual Cooperators
	Ribes Erad.	Canker Elimin.	
Maine	11,104	25	\$85,354.48
N. H.	693	-	49,031.17
Vt.	2,356	12	75,213.39
Mass.	21,910	-	114,872.72
N. J.	8	-	561.36
Conn.	516	-	11,302.65
N. Y.	5,982	2	176,910.99
Penn.	303	-	2,273.36
All States	42,872	39	\$515,540.12

Town Cooperation

State	No. Town		Amount Town Money Expended
	Appropriations	Contributions	
Maine	1,077	20	\$177,129.29
N. H.	1,805	20	540,531.66
Vt.	167	64	54,616.25
Mass.	4	60	24,411.76
Conn.	130	51	32,588.84
N. Y.	29	3	9,422.78
All States	3,215	218	\$838,700.58

County Cooperation

State	No. County Allotments or Appropriations	Amount Spent By Counties
N. H.	6	\$1,724.08
N. Y.	116	132,323.51
All States	122	\$134,047.59

Table 31 - Control Area Examination and Mapping Work During Period 1933-1948, Inclusive
By States

State	Total Acreage Reported Mapped*	Acreage Examined But Not Mapped	Miles Boundary Lines Painted**	Total Map Days
Maine	2,464,537	4,908,458	1,808 $\frac{1}{2}$	38,595
N. H.	1,844,200	835,309	-	45,582
Vt.	1,700,894	4,392,785	828	24,296
Mass.	1,225,739	1,473,010	1,290	21,761
R. I.	297,419	140,441	-	2,966
Conn.	920,466	2,874,071	3,202 $\frac{1}{2}$	25,832
N. Y.	4,683,673	5,556,640	2,403 $\frac{1}{2}$	56,674
Penna.	997,174	287,457	7,369	45,733
All States	14,134,102	20,468,171	16,901	262,458

*Includes a large amount of remapping especially in Vermont, Connecticut and New York. Also includes areas which were mapped and subsequently discontinued from the control area.

**No record kept of this item after 1945.

Table 32 - Status of Control Area Mapping Work, December 31, 1948

State	Total Acreage of Net Control Area	Acreage Detail Mapped in Net Control Area	% Net Control Area Detail Mapped
Maine	2,477,841	2,162,045	87.3
N. H.	2,915,640	1,546,254	53.0
Vt.	716,208	698,821	97.6
Mass.	1,594,873	1,032,291	64.7
R. I.	135,925	121,521	89.4
Conn.	453,177	453,177	100.0
N. Y.	2,606,728	2,001,923	76.8
N. J.	16,742	0	0
Penna.	685,105	641,376	93.6
All States	11,602,239	8,657,408	74.5

Table 33 - Nursery Sanitation Work, 1930-1948, Inclusive

State	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild & Cult.	Cult. Only		Ribes	Man Days
Maine	Initial	206	103,538	22	163	502.6	.79
	Rework	1,529	10,819	-	300	7.1	.20
	Total	1,735	114,357	22	463	65.9	.27
N. H.	All Rework	3,055	7,826	1	285	2.6	.09
Vt.	" "	2,563	4,961	75	412	1.9	.16
Mass.	Initial	783	30,558	112	147	39.0	.19
	Rework	7,370	19,467	182	1,123	2.6	.15
	Total	8,153	50,025	294	1,270	6.1	.16
N. J.	Initial	1,780	725	565	167	0.4	.09
	Rework	18,156	4,970	184	277	0.3	.02
	Total	19,936	5,695	749	444	0.3	.02
Conn.	Initial	7,683	16,934	165	335	2.2	.04
	Rework	63,929	18,942	980	2,597	0.3	.04
	Total	71,612	35,876	1,145	2,932	0.5	.04
N. Y.	Initial	3,735	31,579	655	424	8.5	.11
	Rework	118,722	136,343	1,246	6,259	1.1	.05
	Total	122,457	167,922	1,901	6,683	1.4	.05
N. J.	Initial	795	2,114	114	109	2.7	.14
	Rework	1,050	765	-	19	0.7	.02
	Total	1,845	2,879	114	128	1.6	.07
Penn.	Initial	4,414	38,954	494	343 $\frac{1}{2}$	8.8	.08
	Rework	29,543	54,074	73	4,137 $\frac{1}{2}$	1.8	.14
	Total	33,957	93,028	567	4,481	2.7	.13
All States	Initial	19,296	224,402	2,127	1,688 $\frac{1}{2}$	11.6	.09
	Rework	245,917	258,167	2,741	15,409 $\frac{1}{2}$	1.0	.06
	Total	265,213	482,569	4,868	17,098	1.8	.06

Table 34 - Status of Nursery Sanitation Work, December 31, 1948

State	Nurseries Where Protection Established and Being Maintained				Acres of Control Areas	Number Nurseries Protected During 1948	No. additional Nurseries Which Established Zones Not Now Abandoned
	Number						
	Federal	State	Private	Total			
Maine	-	1	1	2	409	-	5
N. H.	-	1	1	2	749	-	1
Vt.	-	1	-	1	333	-	-
Mass.	-	4	2	6	1,485	-	10
Conn.	-	-	-	-	-	-	5
N. Y.	-	1	2	3	1,036	3	18
N. J.	1	4	-	5	4,366	5	2
Penn.	-	1	-	1	600	-	1
Del.	-	5	3	8	3,921	-	6
All States	1	18	9	28	12,899	8	50

Table 35 - List of Nurseries Maintaining Sanitation Zones in Northeastern Region
December 31, 1948

	acres of Sanitation Zone
<u>Maine</u>	
Western Maine Nursery - Fryeburg, Maine.....	247
State Nursery - Orono, Maine.....	162
	<u>409</u>
<u>New Hampshire</u>	
Keene Forestry Associates - Keene, N.H.....	350
State Nursery - Bosworth, N.H.....	396
	<u>746</u>
<u>Vermont</u>	
State Nursery - Essex Junction, Vt.....	333
<u>Massachusetts</u>	
Department of Conservation Nursery - Amherst, Mass.....	225
Department of Conservation Nursery - Bridgewater, Mass.....	100
Department of Conservation Nursery - Clinton, Mass.....	150
Department of Conservation Nursery - Erving, Mass.....	50
Kelsey Highlands Nursery - Boxford, Mass.....	900
Western Nursery - Weston, Mass.....	60
	<u>1,485</u>
<u>Connecticut</u>	
Northeastern Forestry Company - Cheshire, Conn.....	356
State Nursery - Barkhamstead, Conn.....	432
Great Pond Nursery - Simsbury, Conn.....	248
	<u>1,036</u>

TABLE 35 - List of Nurseries Maintaining Sanitation Zones in Northeastern Region (Continued)

December 31, 1948

Acreage of
Sanitation Zone

New York

State Nursery - Saratoga Springs, N.Y. (old portion.....	705
(new portion.....	1,605
State Nursery - Lowville, N.Y.....	1,150
N.Y. State College of Forestry Nursery - Syracuse, N.Y.....	230
State Nursery (Division of Fish and Game)- Painted Post, N.Y.....	206
Soil Conservation Service Nursery - Big Flats, N.Y.....	470
	<u>4,366</u>

New Jersey

State Nursery - Washington Crossing, N.J.....	600
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Pennsylvania

Clearfield State Nursery - Clearfield, Penna.....	370
Greenwood State Nursery - Petersburg, Penna.....	411
Mt. Alto State Nursery - Mt. Alto, Penna.....	366
Rockview State Nursery - Pleasant Gap, Penna.....	354
Howard State Nursery - Mt. Eagle, Penna.....	215
Andorra Nursery - Chester Hill, Penna.....	1,065
Fairview Nursery - Fairview, Penna.....	559
Doyle Nursery - Seven Stars, Penna.....	581
	<u>3,921</u>

All States

28 Nurseries.....	12,899
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Table 36 - Special Ribes Nigrum Elimination Work, 1928-1948, Inclusive - By States

State	No. Properties Inspected	No. Patches Located	No. Ribes Destroyed			Total Man Days
			Nigrum	Other Cult.	Total	
Mass.	750,359	6,657	42,629*	432	43,061	7,347
R. I.	110,137	1,917	16,219	1,093	17,312	1,929
Conn.	318,344	32,695**	7,464	42,397	49,861	14,610
N. Y.	526,593	5,128	37,064	761	37,825	5,250
All States	1,705,433	46,397	103,376	44,683	148,059	29,136

*Includes 556 bushes pulled in connection with special black currant elimination project around nurseries in 1925 and 1926.

**The survey in Connecticut included all cultivated ribes. It is estimated that the number of black currant patches in that state did not exceed 1500.

Table 37 - Status of Special Ribes Nigrum Elimination Work - December 31, 1948

State	Years Work Performed	Total Number Townships in State	No. Townships Where Special Black Currant Elimination Work	
			Completed	Partially Completed
Mass.	1930-1940, Incl.	355	346*	-
R. I.	1929-1933 "	39	39	-
Conn.	1930-1935 "	169	169	-
N. Y.	1928-1940 "	996	236	39
All States	-	1,559	790	39

*Nine additional townships on islands next to mainland will not be worked.

In the other states, Ribes nigrum have been eradicated in the worked portions of the control areas in conjunction with regular control activities. Very few black currants have been found in these states.

Table 38 - Bliater Rust Canker Elimination Work, 1932-1948, Inclusive
By States

State	Total Number Pines Examined	Number Fatally Infected Pines Cut Down	Number Infected Pines From Which Cankers Removed	Total Number Cankers Removed	Total Man Days
Ala.	156,779	11,326	22,015	52,237	3,189
A. H.	28,581	5,731	638	711	219
Cal.	272,593	40,924	21,389	25,264	3,047
Ill.	4,778,017	32,416	16,699	22,451	8,762
I. T.	1,965,498	162,606	202,627	273,869	14,429
Mich.	919,698	32,670	130,020	569,029	7,312
All States	8,121,166	285,673	393,388	943,561	36,958

Table 39 - Bliater Rust Canker Elimination Work, 1932-1948, Inclusive
By Land Ownership Classes

Ownership Class	Total Number Pines Examined	Number Fatally Infected Pines Cut Down	Number Infected Pines From Which Cankers Removed	Total Number Cankers Removed	Total Man Days
State & Private Lands	8,059,594	282,297	383,464	911,225	34,482
Acadia Nat. Park, Me.	61,572	3,376	9,924	32,336	2,476
Total	8,121,166	285,673	393,388	943,561	36,958

Table 40 - State Compensation Paid For Cultivated Ribes Destroyed, 1918 to 1948, Inclusive

State	Total No. Cult. Ribes Destroyed	No. Bushes Paid For	% Bushes Paid For	No. Persons Paid Compensation	Amount Paid in Reimbursement	Average Amount Paid Per Bush
Ala.	159,929	0	0	0	0	--
A. H.	160,250	2,008	1.3	63	\$550.60	\$.274
Cal.	18,356	1,646	9.0	133	792.91	.482
Ill.	332,312	42,098	12.7	674	15,029.75	.357
I. T.	41,943	1,410	3.4	58	509.79	.362
Iowa	90,700	175	0.2	16	103.50	.591
N. Y.	188,648	16,340	8.7	1152	5,590.99	.342
N. J.	1,842	0	--	0	0	--
Penn.	58,957	517	0.9	71	167.75	.342
All States	1,052,937	64,104	6.1	2,157	\$22,745.29	\$.354

No federal money has been spent for ribes compensation.

Table 41 - Ribes Eradication Work, 1918-1948, Inclusive
By States

State	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed (Wild & Cult.)	Total Man Days	Per Acre		Acreage Worked Per Man Day
					Ribes	Man Days	
Maine	First	2,522,576	47,113,983	260,970	18.7	.103	2.7
	Second	1,190,379	14,455,431	156,410	12.1	.131	1.6
	Other	130,044	337,542	3,987	2.6	.031	32.6
	Total	3,842,999	61,906,956	421,367	16.1	.110	9.1
N. H.	First	3,281,955	57,730,573	310,238	17.6	.035	10.6
	Second	1,135,523	13,152,244	129,029	11.6	.114	3.6
	Other	111,492	504,095	10,535	4.5	.094	10.6
	Total	4,528,970	71,386,912	449,802	15.8	.099	10.2
Vt.	First	610,914	12,568,163	128,945	20.6	.211	5.7
	Second	242,248	3,171,700	48,650	13.1	.201	6.0
	Other	25,952	125,053	2,919	4.8	.112	8.2
	Total	879,114	15,864,916	180,514	18.0	.205	4.7
Mass.	First	2,109,510	16,957,672	132,256	8.0	.263	10.2
	Second	1,200,847	6,093,864	98,422	5.1	.282	12.2
	Other	127,572	204,790	5,296	1.6	.042	24.2
	Total	3,437,929	23,256,326	235,974	6.8	.069	14.6
R. I.	First	330,050	263,502	21,251	0.8	.064	15.6
	Second	315,111	377,557	53,704	1.2	.170	3.9
	Other	62,508	16,264	2,623	0.3	.042	23.6
	Total	707,669	663,323	77,578	0.9	.110	9.4
Conn.	First	444,293	2,496,108	39,773	5.6	.090	31.2
	Second	446,647	4,888,040	92,929	10.9	.206	4.6
	Other	212,436	277,864	6,597	1.3	.071	12.6
	Total	1,103,376	7,662,012	139,299	6.9	.126	7.9
N. Y.	First	2,865,665	65,989,073	721,396	23.0	.252	4.0
	Second	1,620,673	13,136,592	221,777	8.1	.177	7.3
	Other	739,117	1,824,647	36,155	2.5	.049	20.4
	Total	5,225,455	80,950,312	979,328	15.5	.187	5.7
N. J.	First	16,742	49,493	1,324	3.0	.079	12.6
	Second	1,417	16,971	392	12.0	.277	3.0
	Total	18,159	66,464	1,716	3.7	.094	10.6
Penna.	First	722,802	33,824,203	332,457	46.8	.460	2.6
	Second	339,016	5,964,413	162,580	17.6	.480	2.4
	Other	85,059	290,273	4,662	3.4	.055	13.2
	Total	1,146,877	40,078,889	499,699	34.9	.435	2.7
All States	First	12,904,507	236,998,770	1,948,610	18.4	.191	5.0
	Second	6,491,861	61,256,812	763,893	9.4	.160	5.7
	Other	1,494,180	3,580,528	72,774	2.4	.049	20.5
	Total	20,890,548	301,836,110	2,985,277	14.4	.143	7.0

Table 42 - Ribes Eradication Work, 1918-1948, Inclusive
By Land Ownership Classes

Ownership Class	Type of Work	Gross Acreage Reported	Acreage Worked	No. Ribes Destroyed (Wild & Cult.)	Total Man Days	Per Acre		Acres Worked Per Man Day
						Ribes	Man Days	
State and Privately Owned Lands	First	12,863,555		234,390,007	1,929,876	18.2	.150	6.7
	Second	6,462,818		60,773,934	956,834	9.4	.148	6.8
	Other	1,479,342		3,546,177	71,582	2.4	.048	20.7
	Total	20,805,715		298,710,118	2,958,292	14.4	.142	7.0
National Forests	White Mountain	First	9,529	817,694	2,957	85.8	.310	3.2
		Second	7,843	323,774	1,854	41.3	.236	4.2
		Other	5,317	11,238	253	2.1	.048	21.0
		Total	22,689	1,152,706	5,064	50.8	.223	4.5
	Green Mountain	First	458	3,298	31	7.2	.068	14.8
		Second	115	252	12	2.2	.104	9.6
		Total	573	3,550	43	6.2	.075	13.3
	Allegheny	First	5,449	818,831	3,201	150.3	.587	1.7
		Second	2,926	99,496	743	34.0	.254	3.9
		Other	1,314	17,013	283	12.9	.215	4.6
		Total	9,689	935,340	4,227	96.5	.436	2.3
	Total	First	15,436	1,639,823	6,189	106.2	.401	2.5
		Second	10,884	423,522	2,602	38.9	.240	4.2
		Other	6,631	28,251	536	4.3	.081	12.4
		Total	32,951	2,091,596	9,334	63.5	.283	3.5
National Parks	Acadia	First	20,716	893,940	11,227	43.2	.542	1.8
		Second	18,159	59,356	4,450	3.3	.245	4.1
		Other	8,207	6,100	656	0.7	.080	12.5
		Total	47,082	959,396	16,333	20.4	.347	2.9
	Hickory Run Dam. Area	All						
		First	4,800	75,000	1,318	15.6	.275	3.6
	Total	First	25,516	968,940	12,545	38.0	.492	2.0
		Second	18,159	59,356	4,450	3.3	.245	4.1
		Other	8,207	6,100	656	0.7	.080	12.5
		Total	51,882	1,034,396	17,651	19.9	.340	2.9
All Classes	First	12,904,507		236,998,770	1,948,610	18.4	.151	6.6
	Second	6,491,861		61,256,812	963,893	9.4	.148	6.7
	Other	1,494,180		3,580,528	72,774	2.4	.049	20.5
	Total	20,890,548		301,836,110	2,985,277	14.4	.143	7.0

Table 43 - Ribes Eradication Work on Maintenance Areas, 1946-1948, Inclusive
(No separate record kept of such work prior to 1946)

State	Land Ownership Class	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acre Feet of Work per 1000
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	State & Private	6,595	5,314	9	127	0.8	.02	54.3
	Acadia Nat. Park	8,829	1,162	0	247	0.1	.03	28.1
	Total	15,424	6,476	9	374	0.4	.02	82.4
N. H.	White Mt. Nat. Forest	300	0	0	4	0	.01	10.0
N. t.	All State & Private	28	493	0	8	17.6	.29	3.0
N. I.	"	47,699	9,875	166	1,033	0.2	.02	40.0
Conn.	"	132,992	174,506	0	3,124	1.1	.02	42.0
N. Y.	"	92,857	139,266	39	3,455	1.5	.04	28.0
Penn.	"	30,607	25,920	52	622	0.8	.02	24.0
All States	State & Private	310,778	355,374	266	5,429	1.1	.03	26.0
	National Forest	300	0	0	4	0	.01	75.0
	National Park	8,829	1,162	0	247	0.1	.03	28.1
	Total	319,907	356,536	266	5,680	1.1	.03	26.0

Table 44 - RESULTS OF RIBES ERADICATION WORK IN NORTHEASTERN STATES - ALL YEARS
(As compiled from state leaders' annual reports)

Year	Initial Work					Rework					All Work				
	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day
1918	137,458	2,436,037	31,207	17.7	4.4	-	-	-	-	-	137,458	2,436,037	31,207	17.7	4.4
1919	252,043	4,577,825	43,595	18.2	5.8	-	-	-	-	-	252,043	4,577,825	43,595	18.2	5.8
1920	270,318	4,327,876	29,271	16.0	9.2	-	-	-	-	-	270,318	4,327,876	29,271	16.0	9.2
1921	320,361	3,752,865	29,027	11.7	11.0	-	-	-	-	-	320,361	3,752,865	29,027	11.7	11.0
1922	399,892	4,865,873	30,257	12.2	13.2	-	-	-	-	-	399,892	4,865,873	30,257	12.2	13.2
1923	736,402	7,985,102	49,566	10.8	14.9	-	-	-	-	-	736,402	7,985,102	49,566	10.8	14.9
1924	837,981	9,499,538	52,473	11.3	16.0	21,873	39,889	711	1.8	30.8	758,275	8,024,991	50,277	10.6	15.1
1925	691,977	7,265,997	41,831	10.5	16.5	15,193	102,107	629	6.7	24.2	853,174	9,601,645	53,102	11.3	16.1
1926	644,967	8,645,738	43,936	13.4	14.7	34,001	139,750	1,545	4.1	22.0	725,978	7,405,747	43,376	10.2	16.7
1927	693,609	7,390,124	42,208	10.7	16.4	49,088	263,804	2,481	5.4	19.8	694,055	8,909,542	46,417	12.8	15.0
1928	689,702	6,180,148	44,830	9.0	15.4	102,416	706,447	6,423	6.9	15.9	796,025	8,096,571	48,631	10.2	16.4
1929	703,022	7,344,132	49,314	10.4	14.3	113,595	560,414	5,591	4.9	20.3	803,297	6,740,562	50,421	8.4	15.9
1930	581,653	8,000,377	46,728	13.8	12.4	136,117	399,208	6,637	2.9	20.5	839,139	7,743,740	55,951	9.2	15.0
1931	454,367	6,703,164	44,001	14.8	10.3	52,197	216,690	3,167	4.2	16.5	633,850	8,217,067	49,895	13.0	12.7
1932	317,919	3,788,153	27,476	11.9	11.6	123,924	492,935	5,949	4.0	20.8	578,291	7,196,099	49,950	12.4	11.6
1933	277,145	8,838,049	82,846	31.9	3.3	226,701	1,023,264	11,581	4.5	19.6	544,620	4,811,417	39,057	8.8	13.9
1934	461,888	19,450,919	142,285	42.1	3.2	275,710	3,925,490	69,880	14.2	3.9	552,855	12,763,539	152,726	23.1	3.6
1935	684,232	22,736,662	244,781	33.2	2.8	351,185	3,706,709	77,128	10.6	4.6	813,073	23,157,628	219,413	28.5	3.7
1936	1,048,305	41,517,004	349,487	39.6	3.0	441,057	6,147,759	111,306	13.9	4.0	1,125,289	28,884,421	355,687	25.7	3.2
1937	378,023	13,140,648	137,495	34.8	2.7	736,073	14,225,670	177,825	19.3	4.1	1,784,378	55,742,674	527,312	31.2	3.4
1938	333,928	9,026,070	109,871	27.0	3.0	339,499	4,298,728	75,367	12.7	4.5	717,522	17,439,376	212,862	24.3	3.4
1939	341,736	8,664,667	81,214	25.4	4.2	410,864	4,852,240	95,174	11.8	4.3	744,792	13,878,310	205,045	18.6	3.6
1940	336,764	7,578,673	69,092	22.5	4.8	359,405	4,891,418	79,176	13.6	4.5	701,141	13,556,085	160,390	19.3	4.4
1941	208,247	3,207,536	33,802	15.4	6.2	365,474	3,404,946	69,247	9.3	5.3	701,838	10,983,619	139,239	15.6	5.0
1942	149,076	1,673,202	12,513	11.2	11.9	367,325	2,524,580	44,807	6.9	8.2	575,572	5,732,116	78,609	10.0	7.3
1943	92,928	1,149,803	8,908	12.4	10.4	339,538	1,495,825	20,038	4.4	16.9	488,614	3,169,027	32,551	6.5	15.0
1944	98,659	999,381	8,897	10.1	11.1	275,426	1,424,700	18,510	5.2	14.9	368,354	2,574,503	27,418	7.0	13.4
1945	82,422	673,849	7,628	8.2	10.8	315,441	1,491,780	20,526	4.7	15.4	414,100	2,491,161	29,423	6.0	14.1
1946	221,859	2,468,059	22,691	11.1	9.8	414,825	1,473,419	23,979	3.6	17.3	497,247	2,147,268	31,607	4.3	15.7
1947	219,282	1,726,413	18,426	7.9	11.9	640,624	2,521,150	42,231	3.9	15.2	862,483	4,989,209	64,922	5.8	13.3
1948	206,545	1,384,886	12,454	6.7	16.6	749,069	2,331,182	37,352	3.1	20.1	968,351	4,057,595	55,778	4.2	17.4
Totals	12,872,710	276,998,770	1,948,610	18.4	6.6	8,018,238	64,837,340	1,036,667	8.1	7.7	20,890,548	301,836,110	2,285,277	14.4	7.0

*Wild and cultivated

Note: Acreages for initial and rework in above table and for Connecticut in Table 50 do not agree with data in Table 41 due to adjustments made in Connecticut acreages in 1937 to make acreages agree with permanent CO-105 records. It was not possible to make similar changes in summaries showing acreages worked by years.

Table 45 -- RESULTS OF RIBES ERADICATION WORK IN MAINE - ALL YEARS
(As compiled from state leader's annual reports)

Year	Initial Work					Rework					All Work				
	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day
1918	4,910	92,097	1,618	18.8	3.0	-	-	-	-	-	4,910	92,097	1,618	18.8	3.0
1919	9,216	333,775	1,918	36.2	4.8	-	-	-	-	-	9,216	333,775	1,918	36.2	4.8
1920	10,283	177,424	1,561	17.3	6.6	-	-	-	-	-	10,283	177,424	1,561	17.3	6.6
1921	94,128	57,012	1,062	0.6	88.6	-	-	-	-	-	94,128	57,012	1,062	0.6	88.6
1922	114,884	452,975	2,504	3.9	45.9	-	-	-	-	-	114,884	452,975	2,504	3.9	45.9
1923	202,068	1,221,093	6,040	6.0	33.5	20	284	2	14.2	10.0	202,088	1,221,377	6,042	6.0	33.4
1924	240,175	1,840,048	7,105	7.7	33.8	1,240	17,608	112	14.2	11.1	241,415	1,858,556	7,217	7.7	33.4
1925	165,118	1,715,911	6,272	10.4	26.3	644	9,145	58	14.2	11.1	165,762	1,725,056	6,330	10.4	26.2
1926	182,577	3,069,932	6,536	16.8	27.9	728	54,209	114	74.5	6.4	183,305	3,124,141	6,650	17.0	27.6
1927	156,644	2,592,384	6,899	16.5	22.7	1,010	19,480	137	19.3	7.4	157,654	2,611,864	7,036	16.6	22.4
1928	121,944	1,586,032	7,006	13.0	17.4	708	18,538	56	26.2	12.6	122,652	1,604,570	7,062	13.1	17.4
1929	140,811	2,148,186	6,863	15.3	20.5	232	34,771	73	149.9	3.2	141,043	2,182,957	6,936	15.5	20.3
1930	118,696	2,106,564	7,332	17.7	16.2	810	27,786	181	34.3	4.5	119,506	2,134,350	7,513	17.9	15.9
1931	114,544	1,291,168	5,759	11.3	19.9	2,165	70,230	436	32.4	5.0	116,709	1,361,398	6,195	11.7	18.8
1932	51,151	739,058	3,744	14.4	13.7	30,436	288,654	2,277	9.5	13.4	81,587	1,027,712	6,021	12.6	13.5
1933	73,135	1,890,805	21,449	25.9	3.4	23,047	365,507	3,251	15.9	7.1	96,182	2,256,312	24,700	23.5	3.9
1934	89,896	3,882,840	22,244	43.2	4.0	28,823	290,790	3,157	10.1	9.1	118,719	4,173,630	25,401	35.2	4.7
1935	134,917	4,968,785	43,863	36.8	3.1	64,166	1,063,614	13,419	16.6	4.8	199,083	6,031,999	57,282	30.3	3.5
1936	153,642	9,203,514	42,198	59.9	3.6	203,794	4,386,538	39,218	21.5	5.2	357,436	13,590,052	81,416	38.0	4.4
1937	37,557	1,817,768	11,704	48.4	3.2	74,842	1,434,885	14,235	19.2	5.3	112,399	3,252,653	25,939	28.9	4.3
1938	28,142	1,444,992	12,740	51.3	2.2	87,836	1,321,061	22,257	15.0	3.9	115,978	2,766,053	34,997	23.8	3.3
1939	37,006	1,618,862	10,701	43.7	3.5	52,031	947,417	10,441	18.2	5.0	89,037	2,566,279	21,142	28.8	4.2
1940	38,476	898,270	9,935	23.3	3.9	68,410	832,724	14,045	12.2	4.9	106,886	1,730,994	23,980	16.2	4.5
1941	22,587	399,971	3,489	17.7	6.5	48,537	696,701	7,576	14.4	6.4	71,124	1,096,672	11,065	15.4	6.4
1942	17,690	284,142	1,236	16.1	14.3	35,527	264,062	2,419	7.4	14.7	53,217	548,204	3,655	10.3	14.6
1943	16,694	228,154	1,486	13.7	11.2	69,566	482,803	4,588	6.9	15.2	86,260	710,957	6,074	8.2	14.2
1944	23,158	324,919	2,046	14.0	11.3	53,532	533,775	4,335	10.0	12.3	76,690	858,694	6,381	11.2	12.0
1945	17,549	196,821	1,329	11.2	13.2	81,304	371,778	4,088	4.6	19.9	98,853	568,599	5,417	5.8	18.2
1946	47,269	392,051	3,013	8.3	15.7	119,065	565,201	5,887	4.7	20.2	166,334	957,252	8,906	5.8	18.7
1947	24,826	115,114	1,062	4.6	23.4	139,233	417,265	5,468	3.0	25.5	164,059	532,379	6,530	3.2	25.1
1948	32,883	22,816	250	0.7	131.5	132,717	278,147	2,567	2.1	51.7	165,600	300,963	2,817	1.8	58.8
Totals	2,522,576	47,113,983	260,970	18.7	9.7	1,320,423	14,792,973	160,397	11.2	8.2	3,842,999	61,906,956	421,367	16.1	9.1

*Wild and cultivated

Table 46 - RESULTS OF RIBES ERADICATION WORK IN NEW HAMPSHIRE - ALL YEARS
(As compiled from state leader's annual reports)

Year	Initial Work					Rework					All Work				
	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day
1918	66,292	967,742	8,153	14.6	8.1	-	-	-	-	-	66,292	967,742	8,153	14.6	8.1
1919	163,413	1,681,107	11,054	10.3	14.8	-	-	-	-	-	163,413	1,681,107	11,054	10.3	14.8
1920	203,373	2,084,202	11,575	10.2	17.6	-	-	-	-	-	203,373	2,084,202	11,575	10.2	17.6
1921	137,827	1,664,156	7,075	12.1	19.5	-	-	-	-	-	137,827	1,664,156	7,075	12.1	19.5
1922	178,489	1,825,890	8,971	10.2	19.9	-	-	-	-	-	178,489	1,825,890	8,971	10.2	19.9
1923	267,807	3,514,909	16,126	13.1	16.6	430	6,603	15	15.4	28.7	268,237	3,521,512	16,141	13.1	16.6
1924	324,734	4,038,300	16,437	12.4	19.8	6,668	75,216	310	11.3	21.5	331,402	4,113,516	16,747	12.4	19.8
1925	237,702	3,186,726	13,253	13.4	17.9	24,008	113,627	786	4.7	30.5	261,710	3,300,353	14,039	12.6	18.6
1926	178,287	2,972,033	12,875	16.7	13.8	32,046	160,165	1,377	5.0	23.3	210,333	3,132,198	14,252	14.9	14.8
1927	151,985	2,178,175	9,757	14.3	15.6	74,034	496,501	3,078	6.7	24.1	226,019	2,674,676	12,835	11.8	17.6
1928	145,329	2,045,488	9,866	14.1	14.7	83,201	262,270	2,898	3.2	28.7	228,530	2,307,758	12,764	10.1	17.9
1929	155,719	1,872,732	9,675	12.0	16.1	96,425	236,911	3,015	2.5	32.0	252,144	2,109,643	12,690	8.4	19.9
1930	218,137	2,810,342	14,927	12.9	14.6	6,733	33,085	259	4.9	26.0	224,870	2,843,427	15,186	12.6	14.8
1931	158,004	2,895,714	14,561	18.3	10.9	21,357	130,783	1,141	6.1	18.7	179,361	3,026,497	15,702	16.9	11.4
1932	79,924	867,594	4,595	10.9	17.4	17,308	208,769	920	12.1	18.8	97,232	1,076,363	5,515	11.1	17.6
1933	77,075	4,123,623	24,957	53.5	3.1	21,453	571,200	4,014	26.6	5.3	98,528	4,694,823	28,971	47.6	3.4
1934	75,478	3,500,368	17,926	46.4	4.2	10,967	388,588	2,522	35.4	4.3	86,445	3,888,956	20,448	45.0	4.2
1935	89,318	3,470,021	22,349	38.8	4.0	57,413	1,438,794	12,350	25.1	4.6	146,731	4,908,815	34,699	33.5	4.2
1936	140,940	6,271,119	35,789	44.5	3.9	165,947	3,799,133	32,675	22.9	5.1	306,887	10,070,252	68,464	32.8	4.5
1937	35,295	1,596,885	8,726	45.2	4.0	66,838	936,850	9,891	14.0	6.8	102,133	2,533,735	18,617	24.8	5.5
1938	31,388	1,008,184	6,270	32.1	5.0	49,806	754,345	7,982	15.1	6.2	81,194	1,762,529	14,252	21.7	5.7
1939	19,872	826,470	5,668	41.6	3.5	54,847	937,607	9,108	17.1	6.0	74,719	1,764,077	14,776	23.6	5.1
1940	19,171	795,333	5,235	41.5	3.7	54,379	672,021	8,580	12.4	6.3	73,550	1,467,354	13,815	19.9	5.3
1941	12,786	202,216	2,159	15.8	5.9	41,096	417,577	0,654	10.2	6.2	53,882	619,793	8,813	11.5	6.1
1942	8,728	110,408	979	12.6	8.9	37,411	237,875	3,922	6.4	9.5	46,139	348,283	4,901	7.5	9.4
1943	5,427	165,270	729	30.5	7.4	16,354	181,114	2,252	11.1	7.3	21,781	346,384	2,981	15.9	7.3
1944	5,812	85,561	872	14.7	6.7	14,670	199,055	2,413	13.6	6.1	20,482	284,616	3,285	13.9	6.2
1945	10,795	135,400	1,433	12.5	7.5	27,617	190,284	3,607	6.9	7.7	38,412	325,684	5,040	8.5	7.6
1946	23,551	352,308	3,167	15.0	7.4	57,785	353,207	6,909	6.1	8.4	81,336	705,515	10,076	8.7	8.1
1947	26,049	202,424	2,724	7.8	9.6	82,101	364,131	6,682	4.4	12.3	108,150	566,555	9,406	5.2	11.5
1948	33,248	279,873	2,355	8.4	14.2	126,121	490,628	6,204	3.9	20.3	159,369	770,501	8,559	4.8	18.6
Totals	3,281,955	57,730,573	310,238	17.6	10.6	1,247,015	13,656,339	139,564	11.0	8.9	4,528,970	71,386,912	449,802	15.8	10.1

*Wild and cultivated

Table 47 - RESULTS OF RIBES ERADICATION WORK IN VERMONT - ALL YEARS
(As compiled from state leader's annual reports)

Year	Initial Work					Rework					All Work				
	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day
1918	4,698	78,640	1,620	16.7	2.9	-	-	-	-	-	4,698	78,640	1,620	16.7	2.9
1919	2,460	96,749	692	39.3	3.6	-	-	-	-	-	2,460	96,749	692	39.3	3.6
1920	4,501	36,368	1,060	8.1	4.2	-	-	-	-	-	4,501	36,368	1,060	8.1	4.2
1921	6,319	60,668	1,082	9.6	5.8	-	-	-	-	-	6,319	60,668	1,082	9.6	5.8
1922	13,512	202,718	1,922	15.0	7.0	-	-	-	-	-	13,512	202,718	1,922	15.0	7.0
1923	23,950	273,480	2,525	11.4	9.5	1,240	6,324	131	5.1	9.5	25,190	279,804	2,656	11.1	9.5
1924	24,714	177,779	2,797	7.2	8.8	974	4,967	103	5.1	9.5	25,688	182,746	2,900	7.1	8.9
1925	25,226	311,357	2,684	12.3	9.4	1,396	7,120	147	5.1	9.5	26,622	318,477	2,831	12.0	9.4
1926	16,800	229,312	2,588	13.6	6.5	5,850	29,835	616	5.1	9.5	22,650	259,147	3,204	11.4	7.1
1927	17,090	262,674	2,310	15.4	7.4	2,315	18,421	263	8.0	8.8	19,405	281,095	2,573	14.5	7.5
1928	14,475	148,074	1,881	10.2	7.7	2,292	11,462	271	5.0	8.5	16,767	159,536	2,152	9.5	7.8
1929	10,295	88,282	1,639	8.6	6.3	3,005	22,842	391	7.6	7.7	13,300	111,124	2,030	8.4	6.6
1930	7,245	74,122	1,326	10.2	5.5	5,877	20,597	519	3.5	11.3	13,122	94,719	1,845	7.2	7.1
1931	8,125	38,955	983	4.8	8.3	3,535	10,290	306	2.9	11.6	11,660	49,246	1,289	4.2	9.0
1932	7,476	38,585	738	5.2	10.1	4,373	24,948	442	5.7	9.9	11,849	63,533	1,180	5.4	10.0
1933	17,280	232,849	4,823	13.5	3.6	9,939	90,524	3,279	9.1	3.0	27,219	323,373	8,102	11.9	3.4
1934	19,483	463,260	6,467	23.8	3.0	12,690	258,508	5,830	20.4	2.2	32,173	721,768	12,297	22.4	2.6
1935	28,248	478,587	10,103	16.9	2.8	22,633	254,199	5,837	11.2	3.9	50,881	732,786	15,940	14.4	3.2
1936	85,839	4,275,841	33,900	49.8	2.5	27,315	720,742	8,964	26.4	3.0	113,154	4,996,583	42,864	44.2	2.6
1937	32,736	1,096,935	10,197	33.5	3.2	15,938	191,743	3,590	12.0	4.4	48,674	1,288,678	13,787	26.5	3.5
1938	28,473	675,937	7,994	23.7	3.6	20,248	455,206	6,682	22.5	3.0	48,721	1,131,143	14,676	23.2	3.3
1939	22,113	1,057,583	6,419	47.8	3.4	9,337	387,293	2,452	41.5	3.8	31,450	1,444,876	8,871	45.9	3.5
1940	23,905	741,719	7,258	31.0	3.3	5,037	106,330	1,413	21.1	3.6	28,942	848,049	8,671	29.3	3.3
1941	18,097	406,732	4,855	22.5	3.7	5,815	90,549	1,196	15.6	4.9	23,912	497,281	6,051	20.8	4.0
1942	15,019	151,017	1,313	10.1	11.4	8,464	46,234	776	5.5	10.9	23,483	197,251	2,089	8.4	11.2
1943	8,939	86,056	751	9.6	11.9	5,352	32,515	536	6.1	10.0	14,291	118,571	1,287	8.3	11.1
1944	9,210	71,925	989	7.8	9.3	8,687	98,226	1,265	11.3	6.9	17,897	170,151	2,254	9.5	7.9
1945	13,890	120,911	1,883	8.7	7.4	9,177	67,798	1,238	7.4	7.4	23,067	188,709	3,121	8.2	7.4
1946	18,758	221,580	2,214	11.8	8.5	17,948	120,785	2,424	6.7	7.4	36,706	342,765	4,638	9.3	7.9
1947	38,271	227,567	2,453	5.9	15.6	31,739	131,375	1,950	4.1	16.3	70,010	358,942	4,403	5.1	15.9
1948	43,767	141,900	1,479	3.2	29.6	27,024	87,920	948	3.3	28.5	70,791	229,820	2,427	3.2	29.2
Totals	610,914	12,568,163	128,945	20.6	4.7	268,200	3,296,753	51,569	12.3	5.2	879,114	15,864,916	180,514	18.0	4.9

*Wild and cultivated

Table 48 - RESULTS OF RIBES ERADICATION WORK IN MASSACHUSETTS - ALL YEARS
(As compiled from state leader's annual reports)

Year	Initial Work					Rework					All Work				
	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day
1918	18,706	357,986	4,939	19.1	3.8	-	-	-	-	-	18,706	357,986	4,939	19.1	3.8
1919	10,849	204,256	2,549	18.8	4.3	-	-	-	-	-	10,849	204,256	2,549	18.8	4.3
1920	19,389	1,225,727	3,257	63.2	6.0	-	-	-	-	-	19,389	1,225,727	3,257	63.2	6.0
1921	32,933	637,249	3,216	19.3	10.2	-	-	-	-	-	32,933	637,249	3,216	19.3	10.2
1922	64,302	1,580,662	4,180	24.6	15.4	-	-	-	-	-	64,302	1,580,662	4,180	24.6	15.4
1923	184,988	1,765,580	8,776	9.5	22.1	16,943	25,414	503	1.5	33.7	201,931	1,790,994	8,879	8.9	22.7
1924	158,465	2,061,847	10,828	13.0	14.6	1,311	1,966	39	1.5	33.6	159,776	2,063,813	10,867	12.9	14.7
1925	190,945	779,056	6,673	4.1	28.6	4,256	6,384	127	1.5	33.5	195,201	785,440	6,800	4.0	28.7
1926	183,085	1,104,417	8,343	6.0	21.9	6,145	9,216	182	1.5	33.8	189,230	1,113,635	8,525	5.9	22.2
1927	284,411	896,823	8,149	3.2	34.9	14,942	42,427	582	2.8	25.7	299,353	939,250	8,731	3.1	34.3
1928	227,058	532,109	8,912	2.3	25.5	15,875	25,444	391	1.6	40.6	242,933	557,553	9,303	2.3	26.1
1929	243,879	857,791	9,321	3.5	26.2	20,961	16,849	831	0.8	25.2	264,840	874,640	10,152	3.3	26.1
1930	108,683	1,004,448	4,780	9.2	22.7	28,108	28,078	883	1.0	31.8	136,791	1,032,526	5,663	7.5	24.2
1931	29,815	132,449	2,029	4.4	14.7	85,714	138,424	2,070	1.6	41.4	115,529	270,873	4,099	2.3	28.2
1932	13,584	107,544	999	7.9	13.6	148,022	229,880	4,200	1.6	35.2	161,606	337,424	5,199	2.1	31.1
1933	14,003	223,436	2,151	16.0	6.5	83,104	333,206	5,890	4.0	14.1	97,107	556,642	8,041	5.7	12.1
1934	12,713	836,650	4,525	65.8	2.8	110,419	257,612	5,065	2.3	21.8	123,132	1,094,262	9,590	8.9	12.8
1935	45,417	769,690	12,375	16.9	3.7	66,914	629,783	11,167	9.4	6.0	112,331	1,399,473	23,542	12.5	4.8
1936	59,630	792,187	10,411	13.3	5.7	68,175	1,115,661	15,216	16.4	4.5	127,805	1,907,848	25,627	14.9	5.0
1937	14,840	160,773	1,584	10.8	9.4	42,145	696,826	5,706	16.5	7.4	56,985	857,599	7,290	15.0	7.8
1938	31,199	184,268	3,073	5.9	10.2	86,575	744,498	12,028	8.6	7.2	117,774	928,766	15,101	7.9	7.8
1939	38,467	372,507	3,793	9.7	10.1	70,750	719,191	9,129	10.2	7.7	109,217	1,091,698	12,922	10.0	8.5
1940	29,819	143,414	3,293	4.8	9.1	53,623	348,812	7,206	6.5	7.4	83,442	492,226	10,499	5.9	7.9
1941	7,974	41,420	608	5.2	13.1	66,409	210,209	5,305	3.2	12.5	74,383	251,629	5,913	3.4	12.6
1942	4,643	24,640	255	5.3	18.2	68,142	181,952	3,498	2.7	19.5	72,785	206,592	3,753	2.8	19.4
1943	4,711	12,490	279	2.7	16.9	40,992	75,704	1,920	1.8	21.3	45,703	88,194	2,199	1.9	20.8
1944	7,749	10,749	313	1.4	24.8	35,635	77,633	2,089	2.2	17.1	43,384	88,382	2,402	2.0	18.1
1945	6,975	10,093	358	1.4	19.5	56,401	73,228	1,945	1.3	29.0	63,376	83,321	2,303	1.3	27.5
1946	17,797	25,127	652	1.4	27.3	57,564	101,220	3,091	1.8	18.6	75,361	126,347	3,743	1.7	20.1
1947	25,026	67,548	1,214	2.7	20.6	47,037	141,603	2,851	3.0	16.5	72,063	209,151	4,065	2.9	17.7
1948	17,455	34,736	821	2.0	21.3	32,257	67,432	1,804	2.1	17.9	49,712	102,168	2,625	2.1	18.9
Totals	2,109,510	16,957,672	132,256	8.0	15.9	1,328,419	6,298,654	103,718	4.7	12.8	3,437,929	23,256,326	235,974	6.8	14.6

*Wild and cultivated

Table 49 - RESULTS OF RIBES ERADICATION WORK IN RHODE ISLAND - ALL YEARS
(As compiled from state leader's annual reports)

Year	Initial Work					Rework					All Work				
	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day
1918	12,715	14,419	1,102	1.1	11.5	-	-	-	-	-	12,715	14,419	1,102	1.1	11.5
1919	40,411	46,977	1,753	1.2	23.1	-	-	-	-	-	40,411	46,977	1,753	1.2	23.1
1920	23,164	7,523	1,187	0.3	19.5	-	-	-	-	-	23,164	7,523	1,187	0.3	19.5
1921	26,971	16,574	1,196	0.6	22.6	-	-	-	-	-	26,971	16,574	1,196	0.6	22.6
1922	11,500	11,896	575	1.0	20.0	-	-	-	-	-	11,500	11,896	575	1.0	20.0
1923	28,068	14,475	532	0.5	52.8	3,240	1,264	60	0.4	54.0	31,308	15,739	592	0.5	52.9
1924	47,480	25,314	654	0.5	72.6	5,000	2,350	65	0.5	76.9	52,480	27,664	719	0.5	73.0
1925	25,640	6,922	475	0.3	54.0	-	-	-	-	-	25,640	6,922	475	0.3	54.0
1926	25,537	16,641	523	0.7	48.8	2,670	1,197	78	0.4	34.2	28,207	17,838	601	0.6	46.9
1927	9,735	22,800	532	2.3	18.3	-	-	-	-	-	9,735	22,800	532	2.3	18.3
1928	21,461	18,392	822	0.9	26.1	-	-	-	-	-	21,461	18,392	822	0.9	26.1
1929	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1931	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1932	497	417	77	0.8	6.5	5,975	5,670	443	0.9	13.5	6,472	6,087	520	0.9	12.4
1933	80	129	63	1.6	1.3	5,233	3,545	2,582	0.7	2.0	5,313	3,674	2,645	0.7	2.0
1934	-	-	-	-	-	41,726	75,262	6,701	1.8	6.2	41,726	75,262	6,701	1.8	6.2
1935	26,257	13,851	4,582	0.5	5.7	72,260	96,829	14,926	1.3	4.8	98,517	110,680	19,508	1.1	5.0
1936	4,199	4,530	726	1.1	5.8	92,243	89,493	13,971	1.0	6.6	96,442	94,023	14,697	1.0	6.6
1937	7,239	7,153	2,113	1.0	3.4	30,510	46,469	6,164	1.5	4.9	37,749	53,622	8,277	1.4	4.6
1938	6,872	24,162	2,118	3.5	3.2	11,346	20,678	2,092	1.8	5.4	18,218	44,840	4,210	2.5	4.3
1939	4,511	11,642	1,218	2.6	3.7	658	1,044	147	1.6	4.5	5,169	12,686	1,365	2.5	3.8
1940	3,500	777	520	0.2	6.7	25,364	18,109	4,640	0.7	5.5	28,864	18,886	5,160	0.7	5.6
1941	62	2,976	35	48.0	1.8	13,271	12,480	1,817	0.9	7.3	13,333	15,456	1,852	1.2	7.2
1942	3,448	1,932	410	0.6	8.4	1,730	954	195	0.6	8.9	5,178	2,886	605	0.6	8.6
1943	-	-	-	-	-	6,171	2,326	497	0.4	12.4	6,171	2,326	497	0.4	12.4
1944	703	0	38	0	18.5	4,962	3,332	462	0.7	10.7	5,665	3,332	500	0.6	11.3
1945	-	-	-	-	-	7,561	2,944	454	0.4	16.7	7,561	2,944	454	0.4	16.7
1946	-	-	-	-	-	12,555	3,568	430	0.3	29.2	12,555	3,568	430	0.3	29.2
1947	-	-	-	-	-	20,412	4,993	415	0.2	49.2	20,412	4,993	415	0.2	49.2
1948	-	-	-	-	-	14,732	1,314	188	0.1	78.4	14,732	1,314	188	0.1	78.4
Totals	330,050	269,502	21,251	0.8	15.5	377,619	393,821	56,327	1.0	6.7	707,669	663,323	77,578	0.9	9.1

*Wild and cultivated

Table 50 - RESULTS OF RIBES ERADICATION WORK IN CONNECTICUT - ALL YEARS

(As compiled from state leader's annual reports)

Year	Initial Work					Rework					All Work				
	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day
1918	800	10,000	125	12.5	6.4	-	-	-	-	-	800	10,000	125	12.5	6.4
1919	2,500	31,000	726	12.4	3.4	-	-	-	-	-	2,500	31,000	726	12.4	3.4
1920	2,170	42,795	617	19.7	3.5	-	-	-	-	-	2,170	42,795	617	19.7	3.5
1921	8,000	41,476	833	5.2	9.6	-	-	-	-	-	8,000	41,476	833	5.2	9.6
1922	6,175	137,501	1,454	22.3	4.2	-	-	-	-	-	6,175	137,501	1,454	22.3	4.2
1923	14,062	288,581	2,145	20.5	6.6	-	-	-	-	-	14,062	288,581	2,145	20.5	6.6
1924	17,215	291,481	1,869	16.9	9.2	-	-	-	-	-	17,215	291,481	1,869	16.9	9.2
1925	13,735	271,427	1,435	19.8	9.6	2,371	2,054	282	0.9	8.4	16,106	273,481	1,717	17.0	9.4
1926	21,687	175,475	1,492	8.1	14.5	570	7,681	90	13.5	6.3	22,257	183,156	1,582	8.2	14.1
1927	12,068	41,156	558	3.4	21.6	8,836	112,877	2,140	12.8	4.1	20,904	154,033	2,698	7.4	7.7
1928	73,981	99,701	2,102	1.3	35.2	1,124	25,048	402	22.3	2.8	75,105	124,749	2,504	1.7	30.0
1929	28,394	136,595	2,228	4.8	12.7	6,203	8,734	283	1.4	21.9	34,597	145,329	2,511	4.2	13.8
1930	27,253	36,470	942	1.3	28.9	2,342	11,284	383	4.8	6.1	29,595	47,754	1,325	1.6	22.3
1931	1,510	26,036	228	17.2	6.6	4,540	85,051	1,252	18.7	3.6	6,050	111,087	1,480	18.4	4.1
1932	-	-	-	-	-	7,337	135,672	1,435	18.5	5.1	7,337	135,672	1,435	18.5	5.1
1933	-	-	-	-	-	42,513	300,408	9,095	7.1	4.7	42,513	300,408	9,095	7.1	4.7
1934	36,050	79,189	3,185	2.2	11.3	30,537	782,667	12,166	21.4	3.0	72,587	861,856	15,351	11.9	4.7
1935	48,315	360,704	9,501	7.5	5.1	56,233	784,276	15,315	13.9	3.7	104,548	1,144,980	24,816	11.0	4.2
1936	42,269	140,696	4,261	3.3	9.9	36,705	520,665	10,916	14.2	3.4	78,974	661,361	15,177	8.4	5.2
1937	5,144	12,058	1,120	2.3	4.6	52,715	201,571	8,281	3.8	6.4	57,859	213,629	9,401	3.7	6.2
1938	10,231	15,266	1,981	1.5	5.2	56,486	645,959	14,676	11.4	3.8	66,717	661,225	16,657	9.9	4.0
1939	23,950	136,013	2,067	5.7	11.6	34,567	452,843	5,675	13.1	6.1	58,517	588,856	7,742	10.1	7.6
1940	15,582	122,100	853	7.8	18.3	62,597	556,798	8,302	8.9	7.5	78,179	678,898	9,155	8.7	8.5
1941	-	-	-	-	-	49,342	60,102	1,452	1.2	34.0	49,342	60,102	1,452	1.2	34.0
1942	-	-	-	-	-	33,511	113,859	1,212	3.4	27.6	33,511	113,859	1,212	3.4	27.6
1943	-	-	-	-	-	17,547	89,401	1,309	5.1	13.4	17,547	89,401	1,309	5.1	13.4
1944	1,005	388	51	0.4	19.7	24,265	50,218	600	2.1	40.4	25,270	50,606	651	2.0	38.8
1945	-	-	-	-	-	21,947	44,230	1,136	2.0	19.3	21,947	44,230	1,136	2.0	19.3
1946	-	-	-	-	-	45,643	38,893	1,209	0.9	37.8	45,643	38,893	1,209	0.9	37.8
1947	-	-	-	-	-	28,702	65,171	868	2.3	32.6	28,702	65,171	868	2.3	32.6
1948	-	-	-	-	-	59,047	70,442	1,047	1.2	56.4	59,047	70,442	1,047	1.2	56.4
Totals	412,096	2,496,108	39,773	6.1	10.4	691,280	5,165,904	99,526	7.5	6.9	1,103,376	7,662,012	139,299	6.9	7.9

*Wild and cultivated

Table 51 - RESULTS OF RIBES ERADICATION WORK IN NEW YORK - ALL YEARS

(As compiled from state leader's annual reports)

Year	Initial Work					Rework					All Work				
	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day
1918	29,337	915,153	13,650	31.2	2.1	-	-	-	-	-	29,337	915,153	13,660	31.2	2.1
1919	23,194	2,183,961	24,903	94.2	0.9	-	-	-	-	-	23,194	2,183,961	24,903	94.2	0.9
1920	7,438	753,837	10,014	101.3	0.7	-	-	-	-	-	7,438	753,837	10,014	101.3	0.7
1921	14,183	1,275,730	14,563	89.9	1.0	-	-	-	-	-	14,183	1,275,730	14,563	89.9	1.0
1922	11,030	654,231	10,651	59.3	1.0	-	-	-	-	-	11,030	654,231	10,651	59.3	1.0
1923	15,459	906,984	13,822	58.7	1.1	-	-	-	-	-	15,459	906,984	13,822	58.7	1.1
1924	25,198	1,063,869	12,783	42.2	2.0	-	-	-	-	-	25,198	1,063,869	12,783	42.2	2.0
1925	33,611	994,598	11,039	29.6	3.0	1,326	1,420	145	1.1	9.1	34,937	996,018	11,184	28.5	3.1
1926	36,994	1,077,928	11,579	29.1	3.2	1,079	1,499	24	1.4	44.9	38,073	1,079,427	11,603	28.4	3.3
1927	61,676	1,396,112	14,003	22.6	4.4	1,279	16,741	223	13.1	5.7	62,955	1,412,853	14,226	22.4	4.4
1928	85,454	1,750,352	14,241	20.5	6.0	10,395	217,652	1,573	20.9	6.6	95,849	1,968,004	15,814	20.5	6.1
1929	118,465	1,910,315	18,414	16.1	6.4	9,291	79,101	2,044	8.5	4.5	127,756	1,989,416	20,458	15.6	6.2
1930	89,894	1,310,800	14,724	14.6	6.1	8,327	95,860	942	11.5	8.8	98,221	1,406,660	15,666	14.3	6.3
1931	118,353	1,489,180	17,323	12.6	6.8	5,205	18,773	416	3.6	12.5	123,558	1,507,953	17,739	12.2	7.0
1932	145,075	1,229,586	15,428	8.5	9.4	10,822	72,605	1,287	6.7	8.4	155,897	1,302,191	16,715	8.4	9.3
1933	75,773	662,201	14,441	8.7	5.2	65,550	1,269,197	23,396	19.4	2.8	141,323	1,931,398	37,837	13.7	3.7
1934	182,789	5,695,612	60,760	31.2	3.0	81,868	623,985	14,689	7.6	5.6	264,257	6,319,597	75,449	23.9	3.5
1935	245,452	6,431,122	82,969	26.2	3.0	79,504	1,147,804	16,607	14.4	4.8	324,956	7,578,926	99,576	23.3	3.3
1936	429,637	13,641,812	142,692	31.8	3.0	115,220	2,330,708	38,844	20.2	3.0	544,857	15,972,520	181,536	29.3	3.0
1937	178,205	5,561,379	60,653	31.2	2.9	32,742	565,293	10,822	17.3	3.0	210,947	6,126,672	71,475	29.0	3.0
1938	135,448	3,161,234	43,295	23.3	3.1	77,305	612,886	13,683	7.9	5.6	212,753	3,774,120	56,978	17.7	3.7
1939	127,340	2,761,220	26,228	21.7	4.9	104,517	1,012,014	25,147	9.7	4.2	231,857	3,773,234	51,375	16.3	4.5
1940	154,330	3,054,665	22,472	19.8	6.9	73,648	610,565	12,763	8.3	5.8	227,978	3,665,230	35,235	16.1	6.5
1941	112,662	1,370,060	12,275	12.2	9.2	125,876	826,079	11,727	6.6	10.7	238,538	2,196,139	24,002	9.2	9.9
1942	83,303	832,126	5,982	10.0	13.9	151,298	640,539	7,714	4.2	19.6	234,601	1,472,665	13,696	6.3	17.1
1943	43,190	580,464	4,709	13.4	9.2	109,294	463,703	6,918	4.2	15.8	152,484	1,044,167	11,627	6.8	13.1
1944	37,413	379,468	2,902	10.1	12.9	164,989	472,246	8,575	2.9	19.2	202,402	851,714	11,477	4.2	17.6
1945	21,834	115,305	1,784	5.3	15.8	205,537	678,807	11,075	3.3	18.6	227,371	794,112	12,459	3.5	18.2
1946	74,650	1,083,884	8,303	14.5	9.0	321,898	1,281,437	21,262	4.0	15.1	396,548	2,365,321	29,565	6.0	13.4
1947	80,911	884,081	8,252	10.9	9.8	358,076	1,048,816	16,069	2.9	22.3	438,987	1,932,897	24,321	4.4	18.0
1948	67,767	861,804	6,942	12.7	9.8	244,744	873,509	11,987	3.6	20.4	312,511	1,735,313	18,929	5.6	16.5
Totals	2,865,665	65,989,073	721,396	23.0	4.0	2,359,790	14,961,239	257,932	6.3	9.1	5,225,455	80,950,312	979,328	15.5	5.3

*Wild and cultivated

Table 52 -- RESULTS OF RIBES ERADICATION WORK IN NEW JERSEY - ALL YEARS
(As compiled from state leader's annual reports)

Year	Initial Work					Rework					All Work				
	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day
1918	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1919	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1920	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1921	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1923	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1924	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1925	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1926	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1928	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1929	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1931	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1933	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1934	12,695	23,485	316	1.8	40.2	-	-	-	-	-	12,695	23,485	316	1.8	40.2
1935	1,482	19,014	513	12.8	2.9	-	-	-	-	-	1,482	19,014	513	12.8	2.9
1936	2,565	6,994	495	2.7	5.2	-	-	-	-	-	2,565	6,994	495	2.7	5.2
1937	-	-	-	-	-	1,417	16,971	392	12.0	3.6	1,417	16,971	392	12.0	3.6
1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1939	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1940	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1941	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1943	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1944	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1945	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1946	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1947	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1948	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	16,742	49,493	1,324	3.0	12.6	1,417	16,971	392	12.0	3.6	16,159	66,464	1,716	3.7	10.6

*Wild and cultivated

Table 53 -- RESULTS OF RIBES ERADICATION WORK IN PENNSYLVANIA - ALL YEARS

(As compiled from state leader's annual reports)

Year	Initial Work					Rework					All Work				
	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day	Acres Worked	Ribes Destroyed*	Man Days	Ribes Per Acre	Acres Per Man Day
1918	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1919	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1920	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1921	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1923	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1924	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1925	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1926	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1928	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1929	5,459	330,231	1,174	60.5	4.6	-	-	-	-	-	5,459	330,231	1,174	60.5	4.6
1930	11,745	657,631	2,697	56.0	4.4	-	-	-	-	-	11,745	657,631	2,697	56.0	4.4
1931	24,016	829,661	3,118	34.5	7.7	1,408	39,384	328	28.0	4.3	25,424	869,045	3,446	34.2	7.4
1932	20,212	805,369	1,895	39.8	10.7	2,428	57,066	577	23.6	4.2	22,640	862,435	2,472	38.1	9.2
1933	19,799	1,705,006	14,962	86.1	1.3	24,871	991,903	18,373	39.9	1.4	44,670	2,696,909	33,335	60.4	1.3
1934	33,184	4,969,515	26,862	149.8	1.2	28,155	1,029,297	26,998	36.6	1.0	61,339	5,998,812	53,860	97.8	1.1
1935	64,826	6,225,288	58,126	96.0	1.1	21,934	732,460	21,685	33.4	1.0	86,760	6,957,748	79,811	80.2	1.1
1936	129,584	7,180,311	79,015	55.4	1.6	26,674	1,262,730	18,021	47.3	1.5	156,258	8,443,041	97,036	54.0	1.6
1937	67,007	2,887,697	41,398	43.1	1.6	22,352	208,120	16,286	9.3	1.4	89,359	3,095,817	57,684	34.6	1.5
1938	62,175	2,512,027	32,400	40.4	1.9	21,262	297,607	15,774	14.0	1.3	83,437	2,809,634	48,174	33.7	1.7
1939	68,477	1,880,370	25,120	27.5	2.7	32,698	434,009	17,077	13.3	1.9	101,175	2,314,379	42,197	22.9	2.4
1940	51,581	1,822,395	20,426	35.3	2.5	22,416	259,587	12,298	11.6	1.8	73,997	2,081,982	32,724	28.1	2.3
1941	34,079	784,161	10,381	23.0	3.3	16,979	210,883	9,080	12.4	1.9	51,058	995,044	19,461	19.5	2.6
1942	16,245	268,937	2,338	16.6	6.9	3,455	10,350	302	3.0	11.4	19,700	279,287	2,640	14.2	7.5
1943	13,967	77,369	954	5.5	14.6	10,150	97,134	490	9.6	20.7	24,117	174,503	1,444	7.2	16.7
1944	13,609	126,371	1,686	9.3	8.1	8,701	57,295	787	6.6	11.1	22,310	183,666	2,473	8.2	9.0
1945	11,379	95,319	1,241	8.4	9.2	5,281	44,350	436	8.4	12.1	16,660	139,669	1,677	8.4	9.9
1946	39,834	393,109	5,336	9.9	7.5	8,166	56,839	1,019	7.0	8.0	48,000	449,948	6,355	9.4	7.6
1947	24,199	229,679	2,721	9.5	8.9	42,169	157,828	3,049	3.7	13.8	66,368	387,507	5,770	5.8	11.5
1948	11,425	43,757	607	3.8	18.3	124,976	307,844	4,662	2.5	26.8	136,401	351,601	5,269	2.6	25.9
Totals	722,802	33,824,203	332,457	46.8	2.2	424,075	6,254,686	167,242	14.7	2.5	1,146,877	40,078,889	499,699	34.9	2.3

*Wild and cultivated

Table 54 - Status of Ribes Eradication Work in Present Net Control Area in Northeastern Region - December 31, 1949

By States

State	Acreage of White Pine in Net Control Area	Total Acreage of Net Control Area	Acreage Worked			Acreage To Be Worked		Acreage Now On Maintenance Basis	% Net Control Area	
			First Work	Second Work	Other Workings	First Work	Rework		Once	Twice
Maine	970,197	2,477,841	2,256,144	1,218,008	127,027	221,697	1,531,216	724,928	91.1	49.2
N. H.	1,300,484	2,915,640	2,778,415	1,055,557	109,839	137,225	2,207,511	570,904	95.3	36.2
Vt.	158,133	716,208	534,899	232,649	26,803	181,309	359,648	175,251	74.7	32.5
Mass.	583,377	1,594,873	1,567,342	1,056,566	125,357	27,531	562,310	1,005,032	98.3	66.2
N. Y.	60,156	135,925	135,925	130,111	54,592	0	0	135,925	100.0	95.7
Conn.	86,431	453,177	453,177	305,319	189,132	0	0	453,177	100.0	67.4
N. J.	792,056	2,606,728	2,413,423	1,552,060	623,848	193,305	1,604,918	808,505	92.6	59.5
Penn.	3,771	16,742	16,742	1,417	0	0	0	16,742	100.0	8.5
Pa.	135,195	685,105	598,352	251,714	52,105	86,753	342,108	256,244	87.3	36.7
All States	4,089,800	11,602,239	10,754,419	5,803,401	1,308,703	847,820	6,607,711	4,146,708	92.7	50.0

By Land Ownership Classes

State and Private Land	Private Land	Total	First Work	Second Work	Other Workings	First Work	Rework	Acreage Now On Maintenance Basis	Once	Twice
Maine	4,084,359	11,577,059	10,729,239	5,780,267	1,296,071	847,820	6,605,381	4,125,858	92.7	49.9
Green Mt.	1,348	4,190	4,190	3,457	3,111	0	728	3,462	100.0	82.5
Allegheny	89	573	573	115	0	0	0	573	100.0	100.1
Total	4,085,800	11,602,239	10,754,419	5,803,401	1,308,703	847,820	6,607,711	4,146,708	92.7	50.0

TABLE 55- STATUS OF BLISTER RUST CONTROL WORK IN PRESENT NET CONTROL AREA IN NORTHEASTERN REGION BY STATES AND DISTRICTS

(December 31, 1948)

State	District	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked			Acreage in Control Area			Percentage of Control Area						
					First Working	Second Working	Third Working	Now on Maintenance Basis	In Need of First Work	In Need of Rework	Detail Mapped	Worked Once	Worked Twice	Worked Three Times	On Main- tenance	First Work	Needing Rework
Maine	Bradbury	344,124	91,966	309,349	292,907	131,351	25,252	173,016	51,217	119,891	89.9	85.1	38.2	7.3	50.3	14.9	34.8
	Calderara	790,050	314,213	717,341	727,280	420,277	23,426	134,832	62,770	592,448	90.8	92.1	53.2	3.0	17.1	7.9	75.0
	Pike	875,581	412,509	668,734	866,335	521,384	41,376	313,394	9,246	552,941	76.4	98.9	59.5	4.7	35.8	1.1	63.1
	Waterville(1)	468,086	151,509	466,621	369,622	144,996	36,973	103,686	98,464	265,936	99.7	79.0	31.0	7.9	22.2	21.0	56.8
New Hampshire	Totals For State	2,477,841	970,197	2,162,045	2,256,144	1,218,008	127,027	724,928	221,697	1,531,216	87.3	91.1	49.2	5.1	29.3	8.9	61.8
	Baker	557,763	254,632	238,901	537,205	217,811	24,560	89,475	20,558	447,730	42.8	96.3	39.0	4.4	16.0	3.7	80.3
	Boomer	344,043	130,418	344,043	343,609	134,273	6,472	76,238	434	267,371	100.0	99.9	39.0	1.9	22.2	0.1	77.7
	Codman	204,139	106,501	199,132	198,179	130,824	24,604	66,388	5,960	131,791	97.5	97.1	64.1	12.1	32.5	2.9	64.6
Vermont	Curtis	690,477	289,162	165,654	655,150	191,577	13,698	144,042	35,327	510,508	24.0	94.9	27.7	2.0	21.0	5.1	73.9
	King	774,873	376,605	349,409	750,532	278,413	31,698	118,586	24,341	631,946	45.1	96.9	35.9	4.1	15.3	3.1	81.6
	Richardson	344,345	143,166	249,115	293,740	102,659	8,807	75,575	50,605	218,165	72.3	85.3	29.8	2.6	21.9	14.7	63.4
	Totals For State	2,915,640	1,300,484	1,546,254	2,778,415	1,055,557	109,839	570,904	137,225	2,207,511	53.0	95.3	36.2	3.8	19.6	4.7	75.7
Mass.	Mulholland	223,797	45,731	223,737	145,258	80,240	4,897	20,215	78,539	125,043	99.9	64.9	35.9	2.2	9.0	35.1	55.9
	Palmer	191,964	44,845	191,284	142,492	39,132	5,449	72,395	49,472	70,097	99.6	74.2	20.4	2.8	37.7	25.8	36.5
	Rose	300,447	67,557	283,800	247,149	113,277	16,457	82,641	53,298	164,508	94.5	82.3	37.7	5.5	27.5	17.7	54.8
	Totals For State	716,208	158,133	608,821	534,899	232,649	26,803	175,251	181,309	359,648	97.6	74.7	32.5	3.7	24.5	25.3	50.2
R. I.	Brockway	555,527	229,778	415,928	532,769	234,754	7,944	184,239	22,758	348,530	74.9	95.9	42.3	1.4	33.2	4.1	62.7
	Doore	435,526	129,214	349,470	432,528	356,455	96,119	244,015	2,998	188,513	80.2	99.3	81.8	22.1	56.0	0.7	43.3
	Eastern District	603,820	224,385	266,893	602,045	465,357	21,294	576,778	1,775	25,267	44.2	99.7	77.1	3.5	95.5	0.3	4.2
	Totals For State	1,594,873	583,377	1,032,291	1,567,342	1,056,566	125,357	1,005,032	27,531	562,310	64.7	98.3	66.2	7.9	63.0	1.7	35.3
Conn.	Schreier	135,925	60,156	121,521	135,925	130,111	54,592	135,925	0	0	89.4	100.0	95.7	40.2	100.0	0	0
	Miller	179,725	33,698	179,725	179,725	154,330	100,120	179,725	0	0	100.0	100.0	85.9	55.7	100.0	0	0
	Schreier	185,499	45,047	185,499	185,499	148,074	89,012	185,499	0	0	100.0	100.0	79.8	48.0	100.0	0	0
	Remainder of State	87,953	7,686	87,953	87,953	2,915	0	87,953	0	0	100.0	100.0	3.3	-	100.0	0	0
New York	Totals For State	453,177	86,431	453,177	453,177	305,319	189,132	453,177	0	0	100.0	100.0	67.4	41.7	100.0	0	0
	Barber	375,244	129,380	375,244	344,977	280,418	161,994	132,468	30,267	212,509	100.0	91.9	74.7	43.2	35.3	8.1	56.6
	Charlton	176,205	47,962	175,795	171,495	112,690	52,010	63,825	4,710	107,670	99.8	97.3	64.0	29.5	36.2	2.7	61.1
	Harpp	567,465	263,206	549,708	562,688	500,026	232,094	232,094	4,777	330,594	96.9	99.2	88.1	40.9	40.9	0.8	58.3
N. J.	Hick	204,143	43,415	193,563	193,563	129,913	36,556	54,291	10,580	139,272	94.8	94.8	63.6	17.9	26.6	5.2	68.2
	Holcomb	233,123	64,960	192,662	220,705	176,269	78,591	44,028	12,418	176,677	82.6	94.7	75.6	33.7	18.9	5.3	75.8
	Lilley	235,240	47,306	204,355	207,670	109,713	21,895	33,301	27,570	174,369	86.9	88.3	46.6	9.3	14.2	11.7	74.1
	Sievers	317,845	80,896	196,115	285,920	62,003	10,393	160,265	31,925	125,655	61.7	90.0	19.5	3.3	50.4	10.0	39.6
Penna.	Woolschlager	249,334	71,282	104,007	241,334	117,034	30,315	47,184	8,000	194,150	41.7	96.8	46.9	12.2	18.9	3.2	77.9
	Sub-Totals For Present Districts	2,358,599	748,407	1,991,449	2,228,352	1,488,066	623,848	767,456	110,247	1,460,896	84.4	94.5	63.1	26.4	32.5	5.5	62.0
	Counties Outside (2)	248,129	43,649	10,474	185,071	63,994	0	41,049	63,058	144,022	4.2	74.6	25.8	0	16.5	25.4	58.1
	Totals For State	2,606,728	792,056	2,001,923	2,413,423	1,552,060	623,848	808,505	147,305	1,604,918	76.8	92.6	59.5	23.9	31.0	7.4	61.6
All States	" " "	16,742	3,771	0	16,742	1,417	0	16,742	0	0	0	100.0	8.5	0	100.0	0	0
	DeBerti	224,121	37,388	214,189	198,235	65,044	11,210	93,824	25,886	104,411	95.6	88.4	29.0	5.0	41.9	11.6	46.5
	Fatzinger	255,614	57,345	224,027	207,018	85,927	25,551	55,048	48,596	151,970	87.6	81.0	33.6	10.0	21.5	19.0	59.5
	Simmonds	205,370	40,462	203,160	193,099	100,743	15,344	107,372	12,271	85,727	98.9	94.0	49.1	7.5	52.3	6.0	41.7
Totals	Totals For State	685,105	135,195	641,376	598,352	251,714	52,105	256,244	86,753	342,108	93.6	87.3	36.7	7.6	37.4	12.7	49.9
	Sub-Totals Excluding Counties Outside	11,354,110	4,046,151	8,646,934	10,569,348	5,739,407	1,308,703	4,105,659	784,762	6,463,689	76.2	93.1	50.5	11.5	36.2	6.9	56.9
	Present Districts in New York	11,602,239	4,089,800	8,657,408	10,754,419	5,803,401	1,308,703	4,146,708	847,820	6,607,711	74.6	92.7	50.0	11.3	35.7	7.3	57.0
	Totals	11,602,239	4,089,800	8,657,408	10,754,419	5,803,401	1,308,703	4,146,708	847,820	6,607,711	74.6	92.7	50.0	11.3	35.7	7.3	57.0

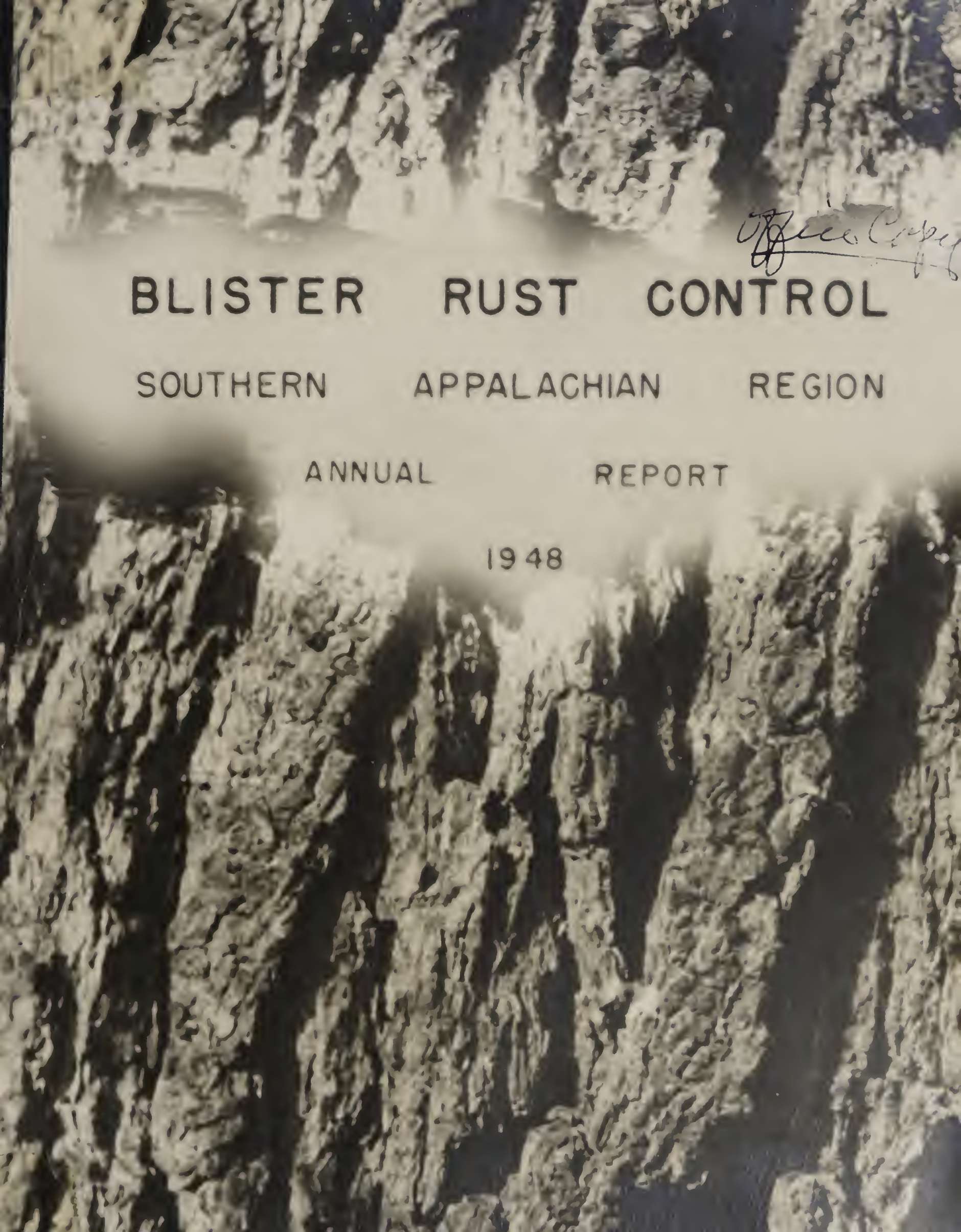
(1) District Leader Bradbury has been supervising control work performed in Waterville district since 1944.

(2) Since October, 1948 state employee has been assigned to this district in western New York.

Table 56 - 1946 Expenditures for Salary and Control by All Cooperative Agencies in Northwestern District, Fiscal Period 1935-1946, Inclusive

State		Male	W. A.	W. A.	W. A.	W. A.	W. A.	W. A.	W. A.	W. A.	All States
Federal	Salary	156,732.24	348,270.07	76,375.75	381,274.27	157.32	139,395.15	1,797,612.82	15,828.15	195,372.70	3,105,993.20
	Individuals	35,344.00	49,031.17	15,515.39	119,172.27	531.30	11,302.85	176,910.92	-	2,273.36	525,540.12
	Groups	177,127.24	540,911.65	61,016.65	26,102.00	-	32,588.84	9,422.78	-	-	675,700.58
	Overhead	-	2,724.00	-	-	-	-	132,329.51	-	-	131,041.50
State	Salary	452,221.01	960,556.98	306,245.37	760,000.00	1,157.28	613,286.61	2,116,275.97	15,828.15	191,246.14	4,794,263.05
	Individuals	103,574.54	434,315.50	119,346.94	321,274.27	1,157.28	707,056.16	479,750.34	6,271.28	71,619.21	1,751,601.65
	Groups	185,269.09	514,677.38	186,706.73	185,117.00	1,000.37	61,170.37	201,692.68	2,929.24	132,935.17	1,163,191.76
	Overhead	163,566.21	193,406.51	100,630.72	65,233.27	10,000.38	45,535.21	149,765.01	-	87,710.59	1,154,410.73
County	Salary	372,934.36	402,084.01	244,245.44	206,771.27	75,443.79	104,902.63	699,457.63	2,942.64	222,045.76	2,392,638.99
	Individuals	771.05	3,430.25	295.65	-	-	-	-	-	5,333.71	8,861.74
	Groups	21,471.51	-	-	-	-	-	-	-	5,333.71	20,191.59
	Overhead	617,313.49	846,323.77	361,341.01	277,231.27	10,367.35	214,967.74	1,112,226.95	5,220.92	263,772.52	4,182,261.50
Federal	Salary	275,630.43	142,340.77	69,805.47	142,340.77	111,845.63	177,053.46	774,789.95	346.50	655,056.17	2,624,455.52
	Individuals	59,128.95	61,537.27	32,166.20	60,107.24	12,157.95	22,472.79	92,134.23	1,081.43	105,474.63	397,763.96
	Groups	5,231.27	30,555.17	8,645.80	17,112.00	2,000.35	212,690.84	23,561.53	-	23,507.24	235,775.97
	Overhead	149,730.76	642,426.87	402,140.27	142,340.77	12,157.95	67,153.99	1,112,226.95	1,303.37	455,814.65	1,814,439.40
State	Salary	-	-	-	11,112.00	-	5,438.13	-	-	-	37,072.18
	Individuals	-	-	-	-	-	-	-	-	-	-
	Groups	1,425.80	-	-	10,100.00	-	94,475.40	2,779.70	-	-	103,603.10
	Overhead	-	-	-	-	1,640.00	1,352.71	5,010.58	-	4,244.65	15,057.94
Federal	Salary	-	-	-	-	3,197.13	-	4,067.87	230.25	9,017.27	24,728.58
	Individuals	-	-	-	-	-	-	612.40	-	220.50	1,033.20
	Groups	-	-	-	-	-	-	-	-	-	-
	Overhead	-	-	-	-	-	-	-	-	-	-
Total Federal Funds		1,003,494.91	170,966.82	533,851.75	533,851.75	715,812.01	616,947.30	2,043,547.93	10,961.62	1,433,251.43	7,364,013.35
Total Federal Funds		1,726,568.40	1,717,351.99	903,210.78	1,717,351.99	912,037.59	822,915.13	3,222,773.98	3,162.55	3,077,184.23	11,546,278.85
Grand Total		2,101,391.41	2,677,908.57	1,103,437.17	1,681,003.23	337,296.77	1,073,231.72	5,333,042.95	17,010.67	1,390,970.77	16,340,560.34
Percentage of Total		13.1	15.4	6.8	10.2	2.1	6.6	32.7	0.2	11.5	100.0

Table 55 does not include any expenditures for regional office. Such expenditures during the period July 1, 1935 to December 31, 1946 were as follows: P.I. and P.D. funds - \$119,661.00; G.P.A. project funds - \$85,101.30; P.I.A. administrative funds - \$34,402.59; total - \$439,170.79. No record available at Directorate of Bureau of Plant Industry and P.W.A. expenditures for the regional office prior to July 1, 1935.



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BLISTER RUST CONTROL

SOUTHERN APPALACHIAN REGION

ANNUAL REPORT

1948

REPORT
ON
WHITE PINE BLISTER RUST CONTROL
SOUTHERN APPALACHIAN REGION
1948

United States Department of Agriculture
Agricultural Research Administration
Bureau of Entomology and Plant Quarantine
Southern Appalachian Regional Office
Box 507
Room 208, Federal Building
Harrisonburg, Virginia
March 1949



BLISTER RUST AT WORK.

VIRGINIA

PART I

MANAGEMENT, COORDINATION, AND TECHNICAL DIRECTION

OF

BLISTER RUST CONTROL

IN

SOUTHERN APPALACHIAN REGION

1949

FOREIGN PROJECT FILE - 1

FOREWORD

Except for a small percentage of the total blister rust control area in the Southern Appalachian Region, it can now be said that we are practically operating on a full maintenance program. During the past few years efforts have been made to complete as rapidly as possible all white pine resurveys, post checking and ribes reeradication in the ribes-bearing white pine sections of the region. During 1948 much of this work was completed and we now have over 95 percent of the region on maintenance. As more territory was placed on maintenance an attempt has been made to adjust our organization accordingly. A gradual reduction in personnel has taken place, more territory has been assigned to the field supervisors and more details are being handled in the regional office to relieve the pressure on our field men. At the same time, all efforts have been made to increase production and more consideration has been given in the selection of pine areas to protect. With limited funds, the area leaders and the field supervisors have seen the necessity of getting as much field work accomplished as possible by cutting corners wherever they could. Through their efforts results have been most encouraging in spite of increasing wage rates and the higher costs of materials and equipment.

SUMMARY OF ACCOMPLISHMENTS DURING THE 1948 FIELD SEASON

TABLE 1

Summary of Work Performed in 1948 By Operating Agencies

Agency	Expenditures (1)	Acres Ribes Free (2)	Acres Worked (Ribes-Bearing)			Ribes Des- troyed	Man- Days (3)
			First	Second	Other		
Bureau State	\$ 66,244, 20,615)	244,070	868	4,735	4,674	181,644	2,940
Forest Service	74,942	111,825	22,631	7,583	3,631	317,441	7,192
Park Service	12,482	8,625	222	102	969	78,251	838
TOTAL REGION	\$ 174,283	364,520	23,721	12,420	9,274	567,336	10,970

- (1) See Table 9 Page 19 for full expenditure breakdown.
- (2) Acres found ribes-free on survey and blocked out on post checks.
- (3) Includes man-days on ribes eradication and on blocking out ribes-free acreage. (2,679 man-days on block-out and 8,291 man-days on ribes eradication.)

Status of Blister Rust

The blister rust was first reported in the region by Dr. Spaulding in 1911. This infection consisted of a single white pine tree in Clarke County, Virginia, which was destroyed. No more was found until 1931. Later findings indicate that the rust became established about 1922 in Pendleton County, West Virginia and Rockingham County, Virginia. During the subsequent 26 years it has been found in six of the nine white pine States in the region. No rust has been found in Kentucky, South Carolina or Georgia.

The disease was reported for the first time in 1948 on white pine in Mercer County, West Virginia and on ribes in eleven counties which were Blount, Morgan and Sevier in Tennessee, and Graham, Swain, Haywood, Transylvania, Buncombe, Madison, Yancey and Mitchell in North Carolina. To date the disease has been found on one or both host plants in 80 counties in the region, of which 67 are within the white pine control area. There are 125 counties in the region that are now regarded as white pine counties. The farthest south the disease has been found was in Graham County, North Carolina, which is approximately 25 miles north of the Georgia line. All of the infections south of Virginia have been found in scattered white pine or non-white pine areas. The same is generally true for southwestern Virginia and southeastern West Virginia. Some commercial damage has occurred in the northern portions of Virginia and West Virginia, as well as western Maryland.

The rather large spread of blister rust in 1948 was probably due to an unusually cool and wet summer and fall.

The map on page 5 shows the distribution of blister rust in the region.

White Pine Survey

About one-half of the white pine survey work performed in 1948 was over new lands. The remainder of the survey work was confined to areas slated for second or third ribes eradication and was generally made in conjunction with post checks. Such surveys are necessary in order to determine white pine conditions before expending funds for ribes eradication.

The time will soon be reached when very little survey work will be needed. Eventually the necessary white pine surveys will be made entirely in conjunction with post checks. Thus, these two activities will be combined to keep abreast with changing white pine and ribes conditions.

Table 2, appearing on page 4, summarizes the resurvey work in the region during 1948.

TABLE 2

Summary of Resurvey Work in Region During 1948

State	Acres White Pine Surveyed	Acres W. P. Retained In Control Area	Control Acres * Covered In Survey	Man. Days Expended	Acres Covered Per Man-Day
Virginia	69,750	69,329	217,181	2,128	107
W. Virginia	4,091	4,091	15,725	113	139
N. Carolina	35,429	36,429	163,305	750	218
TOTAL	113,460	113,059	402,581	3,149	128

* This is the total acreage examined (white pine plus protective zone). However, a good deal of this acreage will be eliminated because of final adjustments in the control area.

White Pine Lumber Production

Although we feel that the following figures for white pine lumber production are conservative they are the most reliable figures we have. It is difficult to obtain the complete picture of white pine lumber production when there are so many small mills operating throughout the region.

TABLE 3

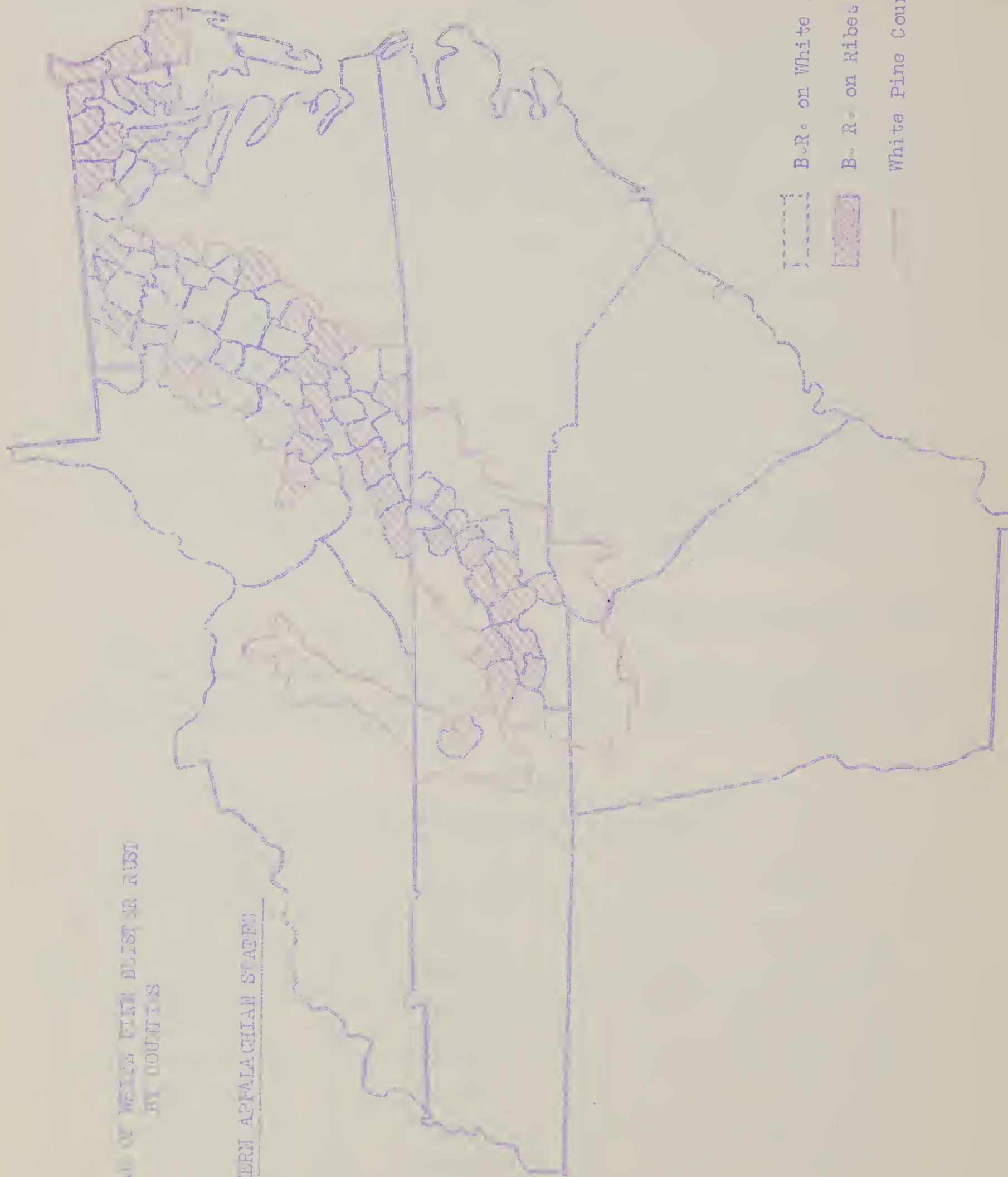
White Pine Lumber Production In 1947 **

State	Board Feet	Stumpage Value Estimated At \$13 per M-B-F.
Maryland	583,000	\$ 7,579
Virginia	18,731,000	243,503
North Carolina	11,081,000	144,053
West Virginia	6,355,000	82,615
Kentucky	359,000	4,667
Tennessee	2,463,000	32,019
South Carolina	642,000	8,346
Georgia	1,233,000	16,029
TOTAL	41,447,000	\$ 538,811

** Data from Census of Manufacturers - Preliminary Report for 1947.

CHIEF OF WHITE PINE BLISTER RUST
BY COUNTIES

SOUTHERN APPALACHIAN STATES



B.R. on White Pine



B. R. on Ribes only.



White Pine Counties.

Alms Production

Alms production was performed in the States of Maryland, Virginia, West Virginia, North Carolina and Tennessee during 1948. Generally all work was accomplished using the standard 3-man crew. However, the "one-man crew" was tried out on typical fiber-bearing country in the northern Appalachian Mountains. Although this method offers several advantages, we found the following objections to its use:

1. Not suitable on steep rocky slopes. Drag lines caught in rocks.
2. Not suitable in heavy brush. Drag lines, regardless of size and length, tend to catch and pull hard.
3. Not suitable in wet or damp woods. Drag lines when damp, even when heavily waxed, pull extremely hard and bind on knots.
4. Men object to working alone.

Although the "one-man crew" will only have limited use in this region, the method will be used wherever applicable. During the limited use in this region in 1948 we found that it is best to:

1. Keep the lanes relatively short - not over 40 yards. This makes it easier to maintain constant lane width by the spring man. The men seemed to like the shorter lanes better and it is easier for the foreman to check on their men.
2. Have 2 men working separate lanes side by side. This overcomes the objection of working entirely alone.
3. Avoid steep, rocky, brushy areas.
4. Use standard type braided vegetable blind cord, soaked in paraffin and waxed and dyed yellow-orange. All types of cord were tried out and is the opinion expressed by most of the men the vegetable blind cord was best.
5. Selection of the best man is desirable.
6. Work areas must be well laid out in advance.

During the 1948 fiber production season we intend to use the one-man crew method on areas which fall in relatively level or rolling country.

All-told, the method certainly has its merits and should be used whenever possible.

A table summarizing the one-man crew work in this region for 1948 will be found on the following page.

TABLE 4

Summary of One-Man Crew Work - 1948

Acres Worked	Ribes Pulled	Man- Days	Acres Per Man-Day	Ribes Per Acre	Ribes Per Man-Day
247.5	7,501	172.1	3.2	12.7	43.6

Other than the general use of salt and borax no chemical eradication was performed. (See section on Investigational work page 12).

During the first half of 1948 all control work was completed on the Jefferson, Monongahela and Pisgah National Forests placing these three forests on maintenance. However, on the George Washington National Forest it will be several years before this forest can be placed on a full maintenance schedule.

On National Park Service lands, one new area was worked on the Great Smoky Mountains National Park on which 235 ribes were pulled per acre. All control work on the Great Smoky Mountains National Park was performed by men working out of temporary camps. On the Shenandoah National Park 1,036 acres were worked some of which was second work and some third. No work was performed on the Blue Ridge Parkway.

About one-third of the ribes eradication work was on State and Private lands. On these lands the work is falling behind, especially in West Virginia and it will continue to lag unless more cooperative funds become available. The disease is now present in the southeastern part of West Virginia and with a fairly heavy ribes regeneration it is feared that the rust will build up to a dangerous point before the second eradication is completed.

Although wage rates and costs of materials and supplies were as high as higher than in any previous year, production was high and the average cost per acre on ribes eradication was on the average lower than it was for the previous four years.

A comparison of acres worked per man-day, costs per man-day and costs per acre on ribes eradication for the five-year period 1944 - 1948 appears on the following page. Costs are based on total regional expenditures and total regional man-days.

TABLE 8

Comparison of Acres Per Man-Day, Cost Per Man-Day and Cost Per Acre
1944 - 1948, Incl.

Year	Acres Worked Per Man-Day	Cost Per Man-Day	Cost Per Acre	Cost Per Acre (Based on Avg. Mean Cost) (of Ribes Eradication) (For 5-Year Period)
1944	3.8	6.31	1.68	1.65
1945	3.9	5.69	1.45	1.73
1946	2.9	7.12	2.45	2.04
1947	4.0	8.72	2.18	2.25
1948	5.5	8.71	1.60	1.58

* Ribes-bearing lands only.

In the above table the average mean cost was figured for the 5-year period so as to show a more accurate trend in the cost per acre figure. It will be noted that per acre costs based on an average cost of ribes eradication over the 5-year period shows a gradual increase through 1947. This was due mainly to increased wage rates and the rise in costs of supplies and materials. The jump in 1946 and 1947 reflect an increase in expenditures for new automotive equipment and no, or very little, increase in production. The labor turnover in 1946 and 1947 was fairly high and a good many effective man-days were lost due to training new men. In 1948 conditions became more stable and even though the cost per man-day was about the same as it was in 1947 the cost per acre dropped from \$2.25 to \$1.58. This was primarily due to an increase in production of 1.5 acres per man-day over that produced in 1947, and 2.6 acres per man-day over 1946.

Checking

In 1948 post checks were made on 41,171 acres of ribes-bearing lands and regular checks on 30,096 acres.

The following table summarizes all checking work performed in 1948. Ribes eradication was done in all States listed in the table except Georgia. The Georgia check was made in the spring during a general inspection trip.

TABLE 6

Summary of Checking Work By States - 1948

STATE	POST (1)			REGULAR (2)			TOTAL		
	Strip Acres	Acres Covered	Man-Days	Strip Acres	Acres Covered	Man-Days	Strip Acres	Acres Covered	Man-Days
Virginia	252.0	5,050	68	1338.0	26,798	415	1590.0	13,848	483
N. Carolina	64.3	1,468	69	-	-	-	64.3	1,468	69
W. Virginia	1353.6	28,155	255	12.5	2,503	48	1366.1	30,658	303
Tennessee	241.0	6,370	158	37.5	795	35	278.5	7,165	193
Georgia	2.8	128	1	-	-	-	2.8	128	1
TOTALS	1913.7	41,171	547	1388.0	30,096	498	3301.7	71,267	1045

(1) Ribes checks made 2-3 years following the last working.

(2) Ribes checks made following current year's work.

TABLE 7

Summary of Ribes Eradication By States - 1948

(All Ownerships)

STATE	ACRES WORKED			Ribes Destroyed	Man-Day On Ribes Eradication	Acres Worked per Man-Day	Ribes Pulled per Acre	ACRES CLOTTED OUT AS RIBES-FREE	
	First Working	Second Working	Other Workings					Acres	Man-Days
Maryland	-	-	1,606	3,725	116	15.8	2.3	-	-
Virginia	23,405	7,448	5,259	327,105	6,137	5.5	8.4	277,138	1,087
N. Carolina	226	-	148	61,356	78	2.1	162.11	162,665	734
W. Virginia	90	4,577	3,725	174,563	1,173	15.0	20.8	28,258	256
Tennessee	-	395	536	6,587	187	4.9	7.1	540	56
TOTAL	23,721	12,420	9,274	567,336	8,291	5.5	13.5	366,520	1,870

TABLE 8

Summary of Rites Radiation By States, 1959 - 1968
(All Ownerships)

STATE	TOTAL ACRES		ACRES WORKED			RITES DESTROYED	MAN- DAYS	CULLAGE ON MAIN- PENANCE	% ON MAIN- PENANCE	UN- WORKED ACREAGE	ACREAGE REQUIRING REFUGA
	Acres Under Control	Acres Control	First Working	Second Working	Other Working						
Delaware	242	6,186	6,186	-	-	6,889	258	6,186	100	-	-
Maryland	72,973	175,156	172,867	17,705	21,555	5,798,997	22,800	154,406	89	2,289	18,461
Virginia	630,954	1,817,873	1,739,313	69,916	22,480	11,595,694	122,663	1,610,045	92	78,560	129,263
N. Carolina	731,102	1,628,775	1,626,002	10,015	4,003	2,810,052	50,936	1,614,304	93	2,766	11,705
West Virginia	340,089	855,478	849,077	118,804	5,723	7,320,389	69,117	660,700	78	16,401	186,377
Alabama	49,173	146,314	146,314	65	65	5,078	1,579	146,314	100	-	-
Tennessee	77,029	1,612,711	1,638,210	17,590	2,521	6,598,512	29,523	1,638,210	99	2,160	42,213
S. Carolina	64,192	130,370	130,970	29,632	-	7,487	2,227	130,870	100	-	-
Georgia	541,478	674,823	674,355	1,008	390	2,995,587	12,630	674,015	99	470	340
TOTALS	3,253,748	7,038,193	6,983,207	264,738	56,737	34,053,685	337,212	6,612,848	95	104,886	370,274

Viewing the Major Portion of 100,000 Acres of White Pine Forest in One Day

PROTECT WHITE PINE FROM BLISTER RUST

WHITE PINE

HOW BLISTER RUST SPREADS AND DESTROYS WHITE PINE

BELOW VIEWING
Secretary of the
United States
Department of
Agriculture
Member of
Outdoor Writers
Association
of America

History tells us that in
the early days of the
settling of the West
the white pine was
the main source of
timber for the
building of the
great cities of the
West. It was the
white pine that gave
the West its name.

BLISTER RUST SPREADS FROM CUR-
RANT AND GOOSEBERRY PLANTS
TO WHITE PINE

BLISTY



White

White

The
White Pine Blister Rust
Disease

USE OF NEW BLISTER RUST FILMS
HIGHLIGHTED 1948 INFORMATIONAL
ACTIVITIES.

Informational Activities

Early in 1948 the Southern Appalachian film "Return of the Pines" was released. This film along with the other new blister rust control films "Blister Rust, Enemy of the Pines", "Paul Bunyan Had a Son", and "Our White Pine Heritage" added new impetus to the program. The films were presented at 187 meetings during the year and were seen by 10,022 persons. Our cooperators, such as the District Foresters, Town Foresters, Soil Conservation Service Foresters and the National Forest and Park Rangers, have been using the films in conjunction with the educational programs in their districts and report that they have been enthusiastically received.

In the spring of 1948 the North Carolina Extension Forester's office, through the County Agents, arranged a series of meetings in various north-western North Carolina counties. A blister rust control representative accompanied a member of the Extension Forester's staff on the two-week tour. Blister rust and conservation films were shown and general forestry problems were discussed.

News items were published in many papers throughout the control area at well chosen times during the year. Probably the most unique and effective articles were those written outside our own organization by Mr. Leo W. Young, Secretary of the Upper Pocahontas County (West Virginia) Sportsmen's Association, after making a tour of white pine areas in Pocahontas and Greenbrier Counties, West Virginia. These articles appeared in several West Virginia papers having a large circulation in the white pine zone.

Exhibits were not used at as many fairs as in some previous years, but those placed at the more important fairs attracted considerable attention. The movies were used in conjunction with several of the exhibits and these always attracted a crowd. At the Staunton (Virginia) Fair an exhibit with the theme "Erosion Control Through Reforestation" was presented cooperatively by U. S. Forest Service, Soil Conservation Service, The Virginia Forest Service and our own organization. The main portion was built by the Department Exhibit Service and each of the cooperating agencies added their portion to fit the central theme. As part of the exhibit, movies, furnished by each agency were shown by rear-view projection. The booth was large enough to provide room for twenty-some chairs and these chairs along with sound-color movies were quite an attraction. Each agency was satisfied that they were well rewarded for their efforts as a result of the way the exhibit was received.

Several individuals and some small groups were taken on "Show-Me" trips in various parts of the region. University of West Virginia forestry students located at Camp Wood, Neola, West Virginia for summer field training were one of the larger groups making a field trip. They were shown blister rust infection on the Spice Run area in Greenbrier County, West Virginia.

To summarize, during 1948, 4,908 blister rust publications were distributed; 42 posters placed; 3 radio talks presented; 6 exhibits set up; 8 news items published and the blister rust movies were shown 187 times.

Two new vehicles were purchased during the year - one a Pontiac Sedan and the other a Ford Pickup. A 1939 Pontiac Sedan and 1942 Ford Station Wagon Carry-all (Army type) were sold and the proceeds applied to the purchase price of the new vehicles. Two vehicles on loan from Barberry Irrigation were transferred to this region when declared surplus to the needs of the Barberry program. They were 1941 Chevrolet, one a pick-up and the other a 1-1/2 ton stake truck.

Our fleet now consists of:

- 3 Passenger Cars
- 4 Sedan Deliveries
- 14 Half-ton Panels
- 6 Half-ton Pickups
- 1 Half-ton canopy-top truck
- 2 One and one-half ton Ambulances
- 2 One and one-half ton Panels
- 3 One and one-half ton Stakes

35 Total

The vehicles are in good mechanical condition and because a high percentage are quite new they are not expensive to maintain. They are in the following age groups:

Not over 2-years

62.9%

3-6 years

17.1%

Over 6-years

20.0%

With much of the control area in the region being placed on maintenance, the equipment needs are gradually changing. The need for heavy vehicles, such as 1-1/2-ton trucks, is much less than previously as most work can be done by small crews transported in 1/2-ton units. Therefore, some of the 1-1/2-ton vehicles will be replaced by 1/2-ton units as new ones are needed.

Personnel

1. Regional Office, Harrisonburg, Virginia

J. Curtis Ball, P-4

John R. George, P-3

Henry E. Yost, P-3

Ralph W. Welch, P-3

Stanley J. Dorick, CAF-9

Edward G. Schmidt, CAF-9

Miss Emily M. Lonergan, CAF-4

Mrs. Bernice M. Yockle, CAF-4

Mrs. Audrey J. Franklin, CAF-3

Mrs. June F. Garber, CAF-2

Miss B. Frances Gardner, CAF-2

Regional Leader

Assistant Regional Leader

Reassigned from Pathologist 12/8/48

Area Leader, Area I

Area Leader, Area II

Administrative Assistant

Transferred From Barberry Radiation, Minneapolis, Minn., 5/3/48

Transferred to Blister Rust Control, Spokane, Washington 9/10/48.

Administrative Assistant

Transferred from Blister Rust Control, Spokane, Washington 10/4/48

Clerk-Stenographer

Clerk

Clerk-Stenographer

Clerk-Typist

Clerk-Typist

2. Regional Shop, Bridgewater, Virginia

Moss M. Sayre, CTC-6

Auto Mechanic

Bridgewater, Virginia

3. Field - Area 1

George C. Cramer, SP-6

Walter A. Stegall, Jr., SP-6

Martin Q. Miller, SP-5

Charles A. Rodamer, SP-5

Irvin L. Stringer, SP-5

Henry G. Simmons, SP-4

Miss Joyce L. Cramer, CAF-2

Mrs. Velma H. Foushee, CAF-2

Mrs. Maxine P. Ford

Field Supervisor

Mt. Solon, Virginia

Field Supervisor

Asheville, North Carolina

Field Supervisor

Staunton, Virginia

Control Assistant

Harrisonburg, Virginia

Field Supervisor

Koonarock, Virginia

Purloughed - R.I.P. 8/15/48

Field Supervisor

Monterey, Virginia

Clerk

Mt. Solon, Virginia

Clerk

Tyheville, Virginia

Terminated - R.I.P. 1/31/48

Clerk

Asheville, North Carolina

(Paid by State of North Carolina)

4. Field - Area II

Glenden E. Keaton, SP-6

Clarence M. Fultz, SP-6

Delbert L. Gillispie, SP-5

Miss Jane C. Moore, CAP-3

Field Supervisor,

Pipestem, West Virginia

Field Supervisor

Lost River, West Virginia

Promoted from SP-5, 6/27/48

Field Supervisor

Arbovale, West Virginia

Clerk-Stenographer

Marlinton, West Virginia

Transferred to SO3 Warren, Ohio

11/1/48 after closing Marlinton

West Virginia office.

5. National Park Service

Fields Berton, Checker

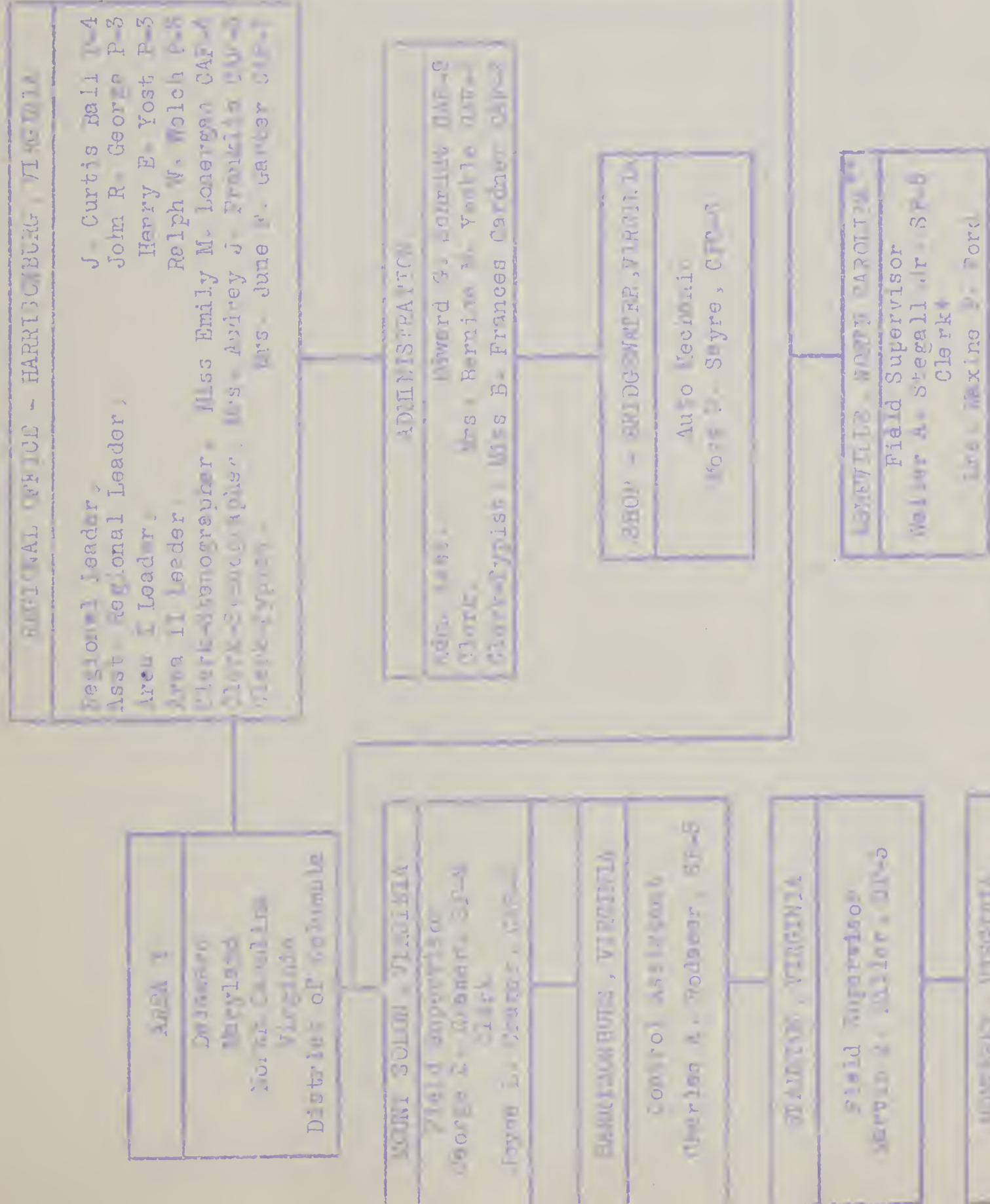
Roy Whaley, Checker

Shenandoah National Park

Luray, Virginia

Great Smoky Mountains National Park

Gatlinburg, Tennessee



* Major Employees:
Supervisor, Radio program in Georgia,
North Carolina, Tennessee and South Carolina

TABLE 9

Summary of Expenditures on Blister Rust Control - 1948

State	Entomology and Plant Quarantine		U. S. Forest Service	National Park Service	Total Federal Funds	State Cooperative Funds		Total All Funds
	Leadership & Coordination	Cooperative Funds				Direct Aid	Indirect Aid	
Maryland	\$ 401	\$ 414	-	-	\$ 315	\$ 315	30	\$ 1,203
Michigan	29,592	3,098	66,575	3,232	102,497	4,587	700	107,784
Minnesota	2,560	4,840	1,269	9,000	17,669	6,343	600	24,612
Mississippi	18,757	4,646	7,098	-	20,501	4,800	100	25,401
Tennessee	680	925	-	250	1,855	2,977	20	4,947
S. Carolina	331	-	-	-	331	-	-	331
TOTALS	\$ 52,321	\$ 13,923	\$ 74,942	\$ 12,482	\$ 153,668	\$ 19,015	\$ 1,600	\$ 174,283



WHITE PINE- 4-H CLUB LAKE
RALEIGH COUNTY, WEST VIRGINIA

The status of Blister Rust control on State and private lands remains the same as in 1947 for the States of Delaware, Kentucky, South Carolina and Georgia. All survey work and ribes eradication was completed in Kentucky in 1947. Ribes are so few in the white pine sections of that State that only periodic inspections will be needed in the future. The same situation holds true for Delaware and South Carolina. However, in Georgia some maintenance work will be necessary before too long and it is planned that all ribes bearing areas can be post checked during the next fiscal year. In 1948 a work plan was made up for Fort Mountain State Park and presented to the Director of State Parks in Atlanta, Georgia. This is R. caroliniana country and regeneration has been fairly high. Repeated spring fires have destroyed a good deal of the young white pine reproduction. Under adequate fire protection this park should grow some excellent white pine.

TABLE 10

Summary of Blister Rust Control in Delaware
1932 through 1948

Land Ownership	Total Acres Worked	Ribes Destroyed	Acres On Maintenance	Acres Not Worked	Acres Needing Re-work
State & Private	6,186	6,889	6,186	-	-

TABLE 11

Summary of Blister Rust Control in Kentucky
1932 through 1948

Land Ownership	Total Acres Worked	Ribes Destroyed	Acres On Maintenance	Acres Not Worked	Acres Needing Re-work
State & Private	114,312	5,029	114,312	-	-
Federal	32,132	49	32,002	-	-
TOTAL	146,444	5,078	146,314	-	-

TABLE 12

Summary of Blister Rust Control in South Carolina
1932 through 1948

Land Ownership	Total Acres Worked	Ribes Destroyed	Acres On Main-tenance	Acres Not Worked	Acres Needing Re-work
State & Private	160,505	7,487	130,870		
Federal	57,562		53,862		
TOTAL	218,067	7,487	184,732		

TABLE 13

Summary of Blister Rust Control in Georgia
1932 through 1948

Land Ownership	Total Acres Worked	Ribes Destroyed	Acres On Main-tenance	Acres Not Worked	Acres Needing Re-work
State & Private	325,520	2,984,096	324,302	470	150
Federal	350,233	11,491	349,713		190
TOTAL	675,753	2,995,587	674,015	470	340

Tables giving the summaries of blister rust control work on State and private lands for 1948 and the status of control to date are shown at the end of this section of the report. For work on National Forest and National Parks see Sections 3 and 4 respectively.

MARYLAND

Native white pine occurs in appreciable quantities in the ten western counties extending from the Piedmont section throughout the mountainous area. White pine is generally distributed in the valleys in Allegany and Washington Counties and is found occasionally in northern Frederick County. East of Frederick County white pine is widely scattered. In Garrett County there is a more general distribution but again it tends to occur in relatively

small, but well defined masses. Wild ribes are frequently found in heavy concentrations in Garrett County. In Allegany and western Washington Counties ribes plants are limited almost entirely to the highest elevations and cool slopes. They are fairly well distributed in the higher elevations of the Blue Ridge Mountains in Washington and Frederick Counties. Most of the Catoctin range they are seldom found.

Since 1933 the ribes population has been reduced where they occur within or near better white pine stands to a point where only occasional workings will be required. In Garrett County ecological conditions are more favorable for both the ribes and the spread of the rust, therefore, more frequent workings will be necessary in order to maintain adequate control.

During 1948, 3,725 wild ribes were destroyed on 1,606 acres in eastern Allegany and a small part of western Washington Counties. This work was confined to the Green Ridge State Forest and adjacent or intermingled private holdings. The work was performed in the early spring season when the leaves were first appearing on ribes bushes. The work was financed jointly by the Maryland State Department of Forests and Parks and the Bureau of Entomology and Plant Quarantine. Field Supervisor C. A. Rodamer was in charge of the work.

A re-examination was made of the privately owned white pine areas in Garrett County and tentatively many of them were regarded as not worth further control work. This change in their status is due to cutting, loss from blister rust infection, and the killing of reproduction due to its being suppressed by competing hardwoods. Many of these areas have not been worked during the last eight or ten years due to the lack of State cooperative funds. The Farm Forester in this county is reviewing many of these areas for the purpose of determining the desirability of attempting to continue control of the rust.

The State Department of Forests and Parks and the University of Maryland have shown excellent cooperation during the year and have both appropriated money which will be supplemented by Federal funds for work during the fiscal year ending June 30, 1949. All of these funds will be used during the spring of 1949. It is planned to complete the reworking of the drainage area of Four Creek in Allegany County and part of Sideling Hill Creek in Allegany and Washington Counties. Some work will be carried on in State owned white pine areas in Garrett County and, if time and funds permit, some privately owned areas may also be worked in this county.

TABLE 14

Summary of Blister Rust Control in Maryland
1932 through 1948

Land Ownership	Total Acres Worked	Ribes Destroyed	Acres On Main- tenance	Acres Not Worked	Acres Needing Re-work
State & Private	212,127	5,798,997	154,406	2,289	18,861

VIRGINIA

In 1948 blister rust control work in Virginia was performed on State and private lands, the George Washington National Forest, the Jefferson National Forest, and the Shenandoah National Park. No work was found necessary during the year on the Blue Ridge Parkway. Most of the work on State and private lands was spent on white pine surveys and post checking. During the year over 320,000 wild ribes were destroyed on slightly more than 34,000 acres. Nearly 175,000 acres were examined on which no ribes were found or so few were present that no ribes eradication was found necessary. Survey work was conducted on over 200,000 acres.

There are 33 white pine producing counties in the State, the status of which is as follows:

Survey complete: Frederick, Shenandoah, Rockingham, Augusta, Bath, Craig, Giles, Bland, Pulaski, Wythe, Grayson, Smyth, and Washington. / 3

Survey partially completed: Warren, Page, Rockbridge, Botetourt, Alleghany, Roanoke, Carroll, Highland, and Montgomery 9

No survey believed necessary at present: Rappahannock, Madison, Greene, Albemarle, Nelson, Amherst, Bedford, Franklin, Floyd, Patrick, and Henry. //

The surveys are practically completed on the Shenandoah National Park and the program is adequate to maintain control.

The progress of the work on the National Forests and Parks is considerably ahead of that on the State and private holdings. The Jefferson National Forest is practically on maintenance. The same is true with the Blue Ridge Parkway except for those sections which remain to be built. Control work on the George Washington National Forest is progressing satisfactorily but it will be several years before the entire forest can be placed on maintenance.

Areas are generally regarded as being on maintenance when the white pine and control area are free of wild ribes, or when the wild ribes population has been reduced to a point where it is estimated that no ribes eradication work will be required for several years. The following list shows the maintenance status by counties considering only the State and private holdings:

<u>Counties Entirely On Maintenance</u>	<u>Counties Largely On Maintenance</u>	<u>Counties Requiring Considerable Future Work</u>
Amherst	Albemarle	Alleghany
Bedford	Botetourt	Augusta
Craig	Carroll	Bath
Floyd	Frederick	Bland
Franklin	Giles	Highland
Henry	Grayson	Madison
Montgomery	Wythe	Page
Nelson		Roanoke
Pulaski		

The long range future requirements for blister rust control cannot be accurately estimated at present but it is hoped that a definite work schedule can be prepared during 1949. During the next year it is hoped to complete white pine surveys in Rockbridge and Alleghany Counties. More time will be spent on ribes eradication since there is a pressing need for much of this work.

TABLE 15

Summary of Blister Rust Control in Virginia
1932 through 1948

Land Ownership	Total Acres Worked	Ribes Destroyed	Acres On Maintenance	Acres Not Worked	Acres Needing Re-work
State & Private	* 1,352,768	7,375,119	1,279,658	55,227	46,486
Federal	478,941	4,220,575	330,367	23,333	82,782
TOTAL	1,831,709	11,595,694	1,610,025	78,560	129,268

* Includes initial, second and other workings.

NORTH CAROLINA

Blister rust control work carried on in North Carolina during 1948 was the re-examining of formerly worked ribes-bearing areas and ribes eradication work where it was found necessary. A large acreage of white pine was resurveyed in Haywood and Buncombe Counties. Although this required a large percentage of the total man-days it is considered secondary to ribes eradication and checking work. Work conducted on State and private lands was financed by the State Department of Agriculture and the U. S. Department of Agriculture. Work performed on the Pisgah National Forest and the Great Smoky Mountains National Park was financed by those agencies, the U. S. Forest Service and National Park Service respectively. Over 61,000 wild ribes were destroyed on 374 acres. Almost 1,500 ribes-bearing acres were checked which did not require crew work. The resurvey covered over 165,000 acres. This survey was necessary to bring the status of white pine conditions up to date in several western counties.

Conditions were evidently very favorable for the spread of the rust from white pine to ribes in the southwestern portion of the State during 1948. The rust was found for the first time this year on ribes in the following counties: Mitchell, Vancey, Madison, Buncombe, Transylvania, Haywood, Swain and Graham. The first indications of the spread were the

result of the rust being reported by Assistant Chief Ranger, J. B. Light, of the Great Smoky Mountains National Park late in August. From then until the leaves fell intensive scouting was carried on in the Park by the Park Service personnel, and in the adjoining counties by men employed on the cooperative project. The reported infection on white pine remains the same as last year (confined to Ashe and McDowell Counties), but the spread during 1948 indicates very strongly that there are likely small and widely scattered infections on white pine in other counties. All of the infections to date on white pine have been found outside of established control areas. It appears likely that the rust will continue to spread in scattered or isolated white pine stands of low value. Such white pines are frequently found at the higher elevations in association with heavy concentrations of wild ribes. In such situations control work is uneconomical and since rust cannot spread directly from one white pine tree to another such work will not be necessary. A high measure of control has already been established in the good white pine sections at lower elevations which are generally below the wild ribes range.

The future problem consists of periodic examinations of the wild ribes-bearing sections in association with good white pine, and reeradication work, when and if the wild ribes comeback is sufficient that the presence of these bushes become dangerous. Some additional survey work should be carried on periodically since white pine is rapidly spreading in many sections of the State.

Cooperation from the State Department of Agriculture, as well as from the National Forests, National Parks, T.V.A., and other State agencies has been excellent. The situation is well under control and can continue so with a moderately sized maintenance program.

TABLE 16

Summary of Blister Rust Control in North Carolina
1932 through 1948

Land Ownership	Total Acres Worked	Ribes Destroyed	Acres On Maintenance	Acres Not Worked	Acres Needing Re-work
State & Private	1,382,684	2,645,912	1,368,057	2,321	5,916
Federal	257,343	100,544	246,247	445	5,789
TOTAL	1,640,027	2,746,456	1,614,304	2,766	11,705

WEST VIRGINIA

During the current year ribes eradication and various checking activities were performed on State and private lands as well as within the George Washington and Monongahela National Forests. A third working program was begun and virtually completed within Seneca State Forest in Pocahontas County where valuable stands of second growth white pine are located. Third workings were also started during the year in the Dry River Ranger District of the George Washington National Forest in Pendleton County where ribes regeneration seems particularly heavy, and where the rust gained an early foothold. Second working programs were continued in Mercer, Raleigh and Hardy Counties on private lands, and a third working of Lost River State Park in the latter county, was completed during the year.

A total of 8,392 acres of control area were cleared of ribes in 1948 with an expenditure of 1,673 man-days labor. Upon this acreage 174,563 ribes were destroyed. In addition 28,236 acres of control area were examined through a system of post checking in which $2\frac{1}{2}$ to 5 per cent of the area was representatively sampled but was found to be free, or virtually free of ribes growth. Field activities were conducted from funds made available by the Bureau of Entomology and Plant Quarantine, the United States Forest Service and the Conservation Commission of West Virginia. The State Department of Agriculture cooperated through nursery inspection activities and through the regulation of shipments of cultivated ribes planting stock within the blister rust control areas.

Various phases of educational work received considerable emphasis in 1948, and the newly acquired blister rust films were widely used within the white pine belt. Blister rust exhibits were placed at various county fairs, and many on-the-spot demonstrations were conducted to acquaint land owners and forestry-interested groups as to damages caused through blister rust invasion. We find that such local demonstrations are particularly helpful in arousing interest and in securing active cooperation. Since the rust is now rather widely found through the northern two-thirds of the West Virginia white pine belt, local damage to occasional trees can now easily be demonstrated to the many individual land owners and we find it easier to gain their cooperation as a result of "show me" trips.

During 1949 we need to expand our program on privately owned land, since that phase of the control work has lagged because of shortages in funds during the past few years. Recommendations have been made to the Conservation Commission pointing out the immediate needs for such an expanded program. There are approximately 250,000 acres of ribes-bearing lands within State and privately owned control areas within West Virginia. This acreage has all been worked once, but a second working has been accomplished on only 40 per cent of the acreage. In the immediate future, the remaining 60 per cent (approximately 150,000 acres) should be worked a second time, so that ribes growth may be adequately suppressed and damage from the rust may be held to a minimum. When this has been accomplished, a large part of privately owned white pine in the State will need only occasional examinations and local "spot" workings in the future.

Post checking and ribes eradication programs are planned on both the Monongahela and the George Washington National Forests in 1949. The Monongahela work will be confined to reexamination and reworking (where needed) of areas in Pocahontas County which were previously worked five to seven years ago, and the George Washington project will be confined to Pendleton County along the slopes of the Shenandoah Mountain.

TABLE 17

Summary of Blister Rust Control in West Virginia
1932 through 1948

Land Ownership	Total Acres Worked	Ribes Destroyed	Acres On Maintenance	Acres Not Worked	Acres Needing Re-work
State & Private	809,538	6,485,481	533,655	10,599	173,120
Federal	164,066	834,908	127,045	5,802	15,257
TOTAL	973,604	7,320,389	660,700	16,401	188,377

TENNESSEE

Blister rust control work in Tennessee was confined to Johnson County in 1948. Foreman Edward L. New, with a small crew, resumed resurvey and ribes eradication activities in April and continued them through September. It was necessary to halt field operations at that time for the season because of inclement weather.

A considerable number of large R. missouriensis were found and eradicated during the summer. The number of these large bushes found was much greater than had been anticipated. Their size, along with the difficulty of digging them from the sod of pastures, where many were found, was time-consuming and decreased the rate of coverage a great deal. This made it impossible to complete the scheduled work during the season.

Foreman New spent some time in October making a rust survey in several of the white pine counties of the State. Rust was observed on ribes for the first time in Blount, Morgan and Sevier Counties.

Some time was spent on a reconnaissance of the pine areas on the Glades State Forest. No ribes were observed in the pine or within control zone limits. However, some were found in the northern part of the forest and plans have been made to survey the pine areas in the spring of 1949 to be certain that no source of infection exists.

Post checks of known ribes areas in Morgan County are planned for the spring of 1949 to determine if any eradication should be performed. It is also planned to complete the re-work in Johnson County during the next field season.

Of 17 counties in Tennessee that fall within the white pine blister rust control area, only 6 can be classed as active as far as blister rust control work is concerned. The remaining 11 counties are either free of wild ribes within the white pine belt or the ribes areas are so small that no or very little future control work will be necessary. The active counties are: Johnson, Sullivan, Carter, Unicoi, Morgan and Cumberland. The less active counties are: Bladsoe, Rhea and Cocks. Non active counties being: Green, Sevier, Blount, Monroe, Polk, Scott, and Fentress. The status of Roane County is not well known since some survey work remains to be done in this county.

A general reconnaissance made over a large portion of the original control area in Johnson County revealed that a large acreage classed as scattered white pine is not white pine site and adjustments in the original survey will be made. After a period of 10 years white pine on those sites have not increased and in many cases any white pine which was originally present has given way to hardwoods. Mr. R. D. Tanksley, former State Leader reported this situation but as yet no adjustments have been made. However, this will be done for Johnson County in 1949.

TABLE 18

Summary of Blister Rust Control in Tennessee
1932 through 1948

Land Ownership	Total Acres Worked	Ribes Destroyed	Acres On Maintenance	Acres Not Worked	Acres Needing Re-work
State & Private	1,087,988	4,400,932	1,051,055	4,500	10,928
Federal	510,543	1,997,574	564,933	-	3,300
TOTAL	1,698,327	6,398,506	1,615,983	4,500	24,228

TABLE 19

Summary of Ribes Eradication On State And Private Lands - 1948

(Operating Agency - Bureau of Entomology and Plant Quarantine in Cooperation With State Agencies)

STATE	ACRES WORKED				Ribes Des- troyed	Man-Days On Ribes Eradl.	Acres Worked Per Man Day	Ribes Felled Per Acre	ACRES BLOCKED OFF AS RIBES-FREE (Survey & Post Check)	
	First Working	Second Working	Other Workings	Total Workings					Acres	Man-Days
Maryland	-	-	1,606	1,606	3,725	116	13.8	2.3	-	-
Virginia	774	-	-	774	471	57	13.6	0.6	62,793	518
Carolina	4	-	-	4	29	7	0.6	7.3	153,580	525
Virginia	90	4,340	2,532	6,962	161,203	1,279	5.4	23.2	27,697	251
Tennessee	-	395	536	931	6,213	187	4.9	7.1	-	-
TOTAL BUREAU & STATE	868	4,735	4,674	10,277	171,644	1,646	16.7	16.7	244,070	1,294

TABLE 50

Status of Rites Endowment on State and Private Lands 1932-1948, (cont.)

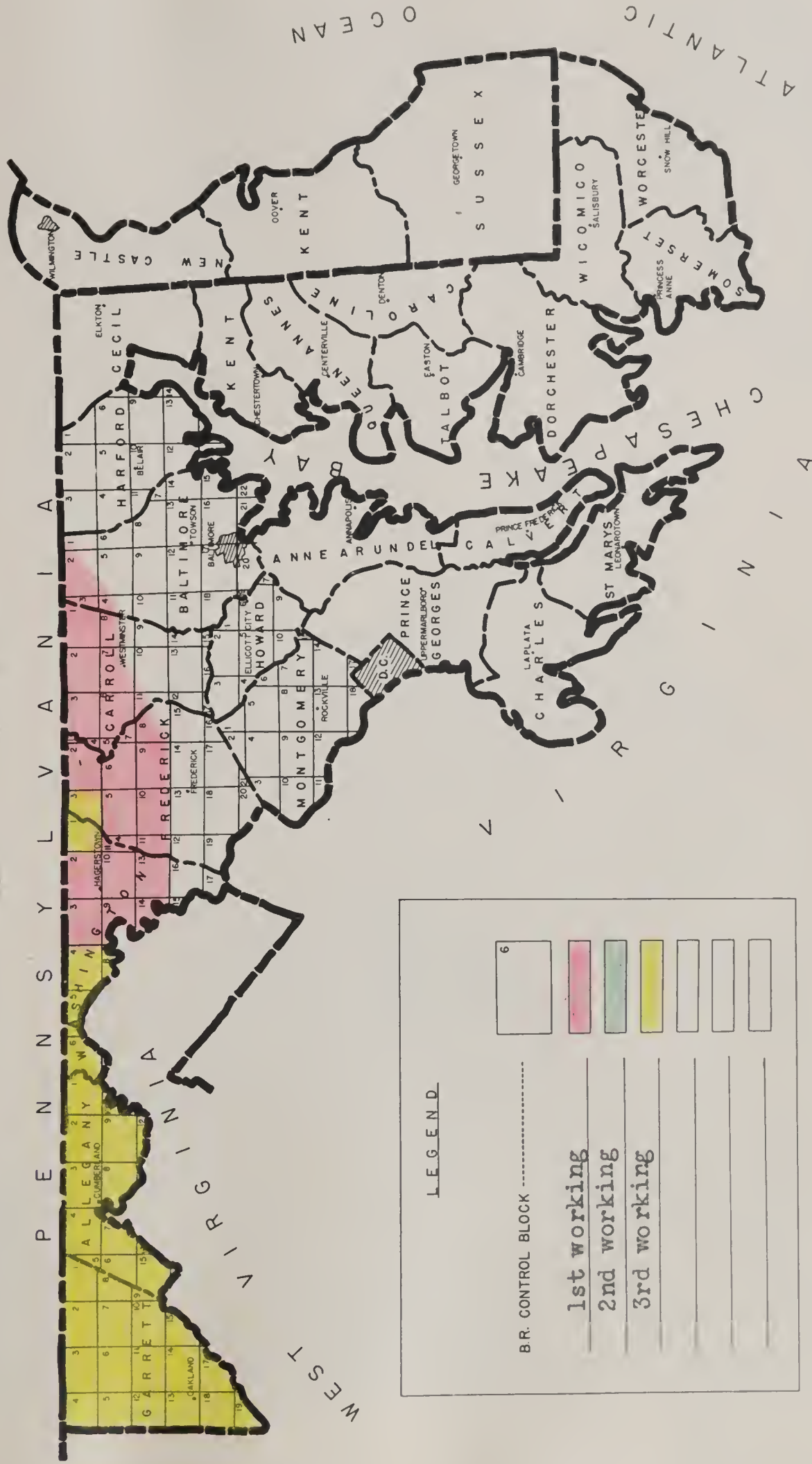
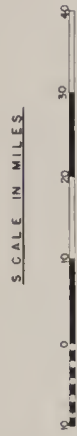
STATE	TOTAL ACRES		ACRES INCURRED			RISES DESTRUCTION	MAN- DATA	AVERAGE ON PRIVATE LANDS	PER CENT OF TOTAL LAND	PER CENT OF TOTAL LAND	TOTAL ACRES INCURRED
	Under Rites Endowment	Acres Incurred	First Incurred	Second Incurred	Other Incurred						
Alabama	742	8,190	8,190	-	-	6,888	868	1,302	100	-	-
Arkansas	97,875	17,300	17,300	11,625	-	7,795,800	60,500	2,400	100	100	11,625
California	487,000	1,045,000	1,045,000	97,887	1,027	7,375	18,700	1,275,888	92	100	1,045,000
Colorado	288,760	2,000,000	2,000,000	8,548	1,000	2,000,000	8,548	1,200,000	100	100	2,000,000
Connecticut	36,100	775,000	775,000	95,015	4,000	8,485,480	67,000	585,800	75	100	775,000
Delaware	71,100	700,000	700,000	-	-	8,000	1,100	1,000	100	100	700,000
Florida	664,800	1,000,000	1,000,000	15,100	1,000	4,400,900	36,800	1,000,000	100	100	1,000,000
Georgia	10,000	10,000	10,000	26,900	-	7,487	1,000	7,000	100	100	10,000
Idaho	200,500	300,000	300,000	470	100	2,000,000	8,700	1,000,000	100	100	300,000
Illinois	1,107,840	2,247,000	2,247,000	187,500	100	27,900,900	10,700	2,000,000	97	100	2,247,000

WHITE PINE BLISTER RUST CONTROL

MAP DESIGNATES: Status
(STATUS-PROGRESS-WORK PLAN, ETC)

DATE REPORTED: 12/31/48

STATE: MARYLAND & DELAWARE



LEGEND

B.R. CONTROL BLOCK	6
1st working	
2nd working	
3rd working	

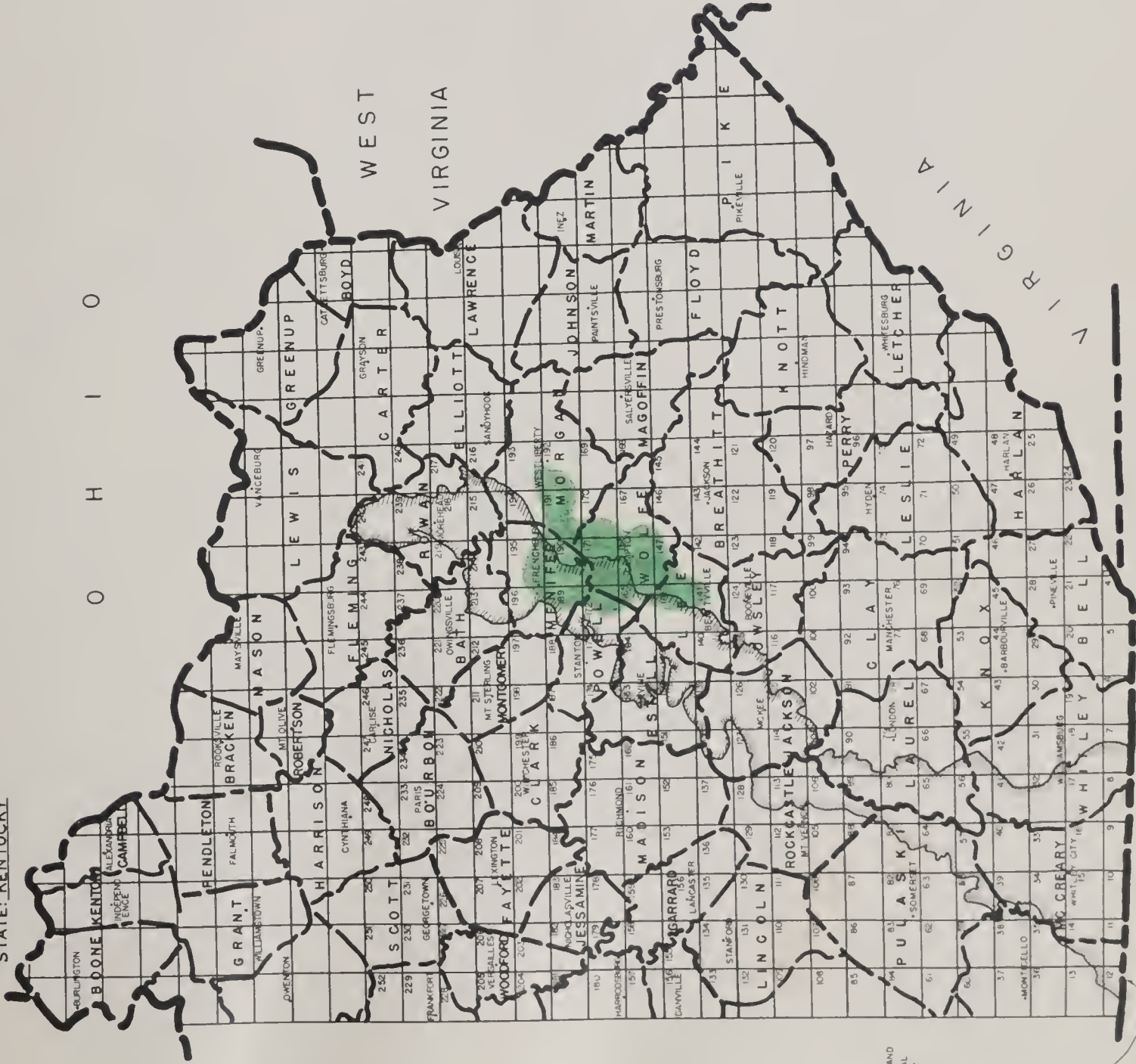
WHITE PINE BLISTER RUST CONTROL

MAP DESIGNATES: Status
(STATUS- PROGRESS- WORK PLAN, ETC.)

12/31/48

DATE REPORTED: _____

STATE: KENTUCKY



LEGEND

NATIONAL FOREST PURCHASE UNITS -----

B. R. CONTROL BLOCK -----

First & Second Working

SCALE
0 10 20 30 40 MILES



T E N N E S S E E

Status

DATE REPORTED: 12/31/48

IRON T R O Z



SCALE

LEGEND

NATIONAL FOREST PURCHASE UNITS -

8 R CONTROL BLOCK -

First working

Second working

6

1

1000

1000

1511

1131

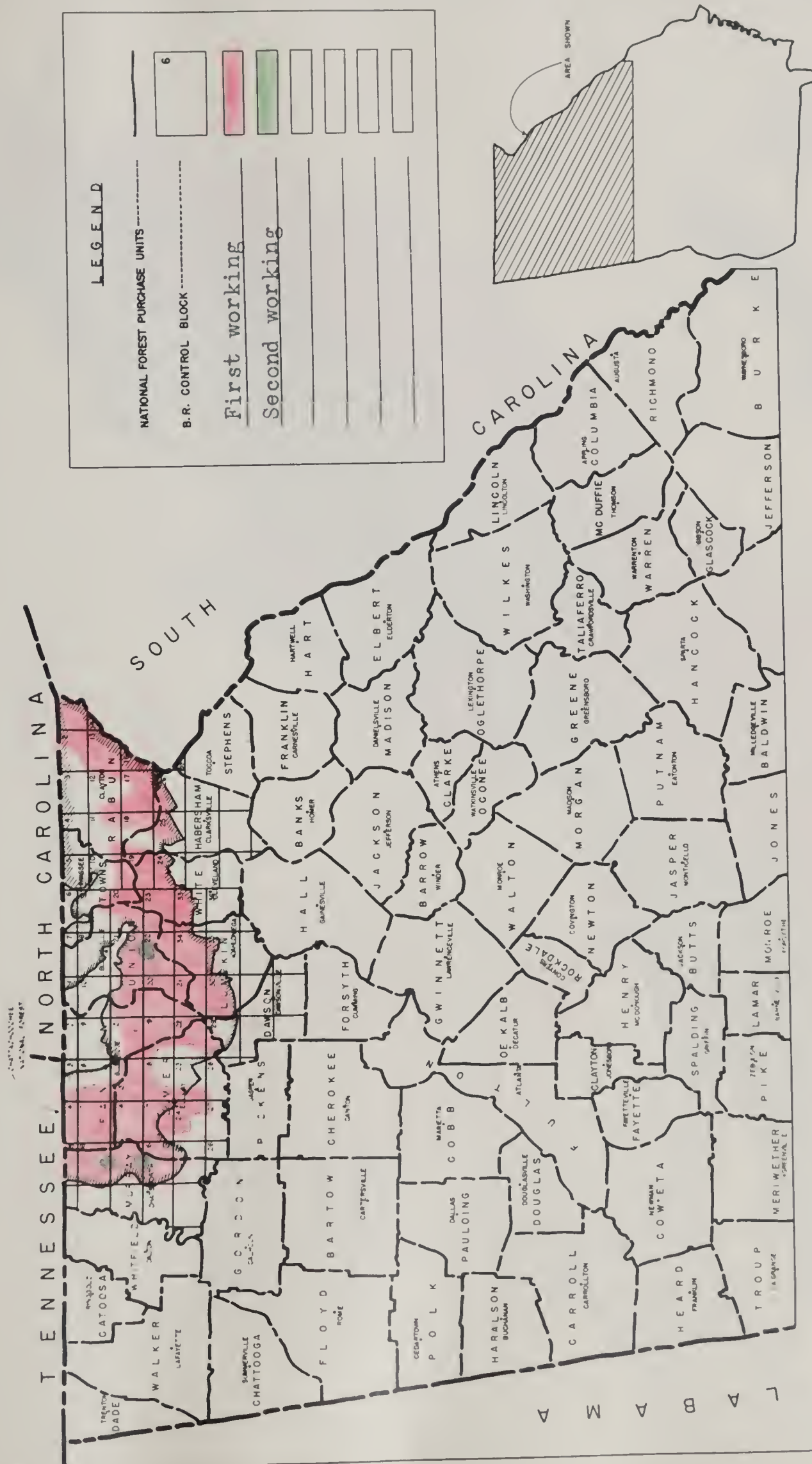
1111

Status

MAP DESIGNATES: (STATUS- PROGRESS- WORK PLAN, ETC.)

STATE: GEORGIA

DATE REPORTED: 12/31/48



SCALE

0 10 20 40 MILES

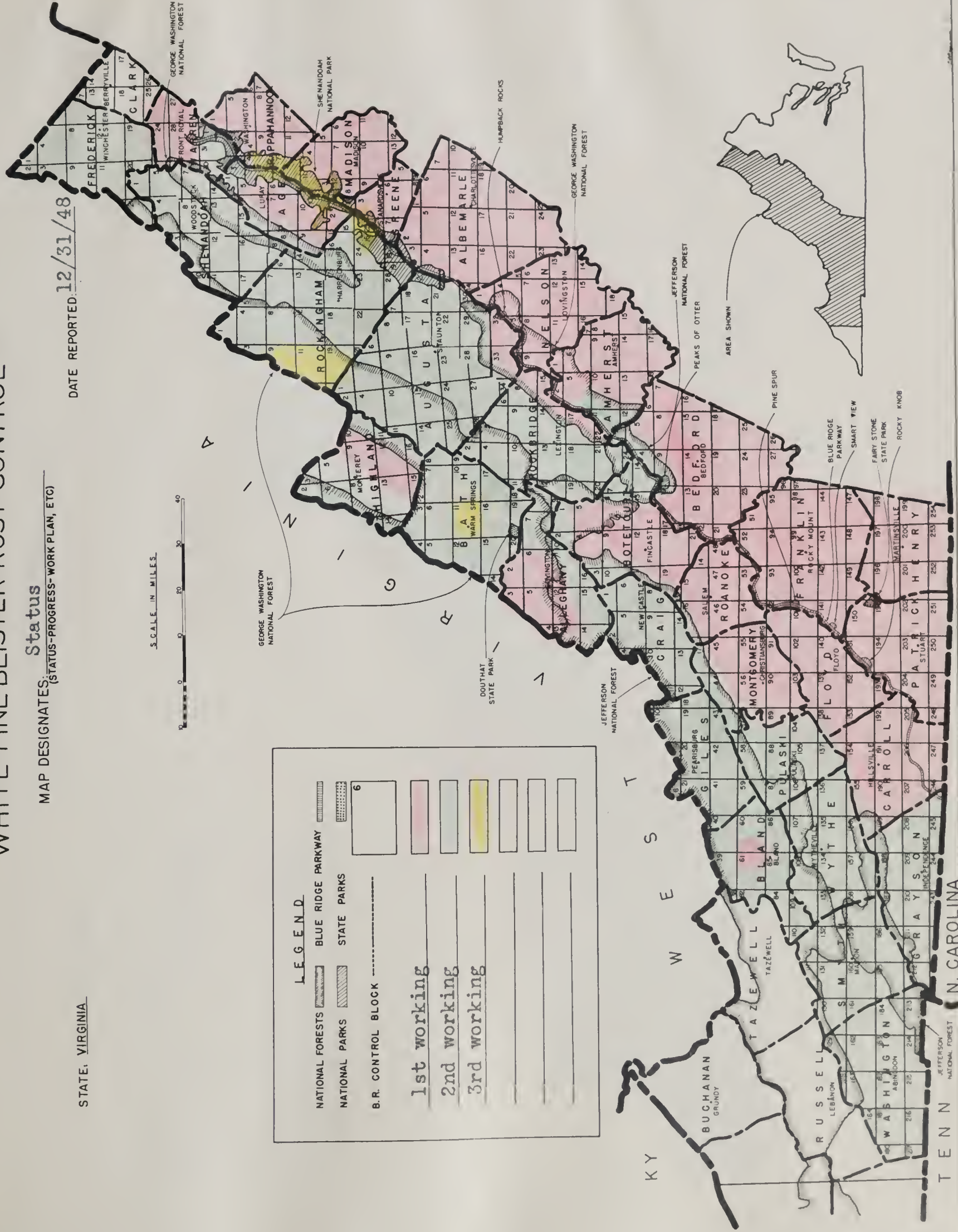
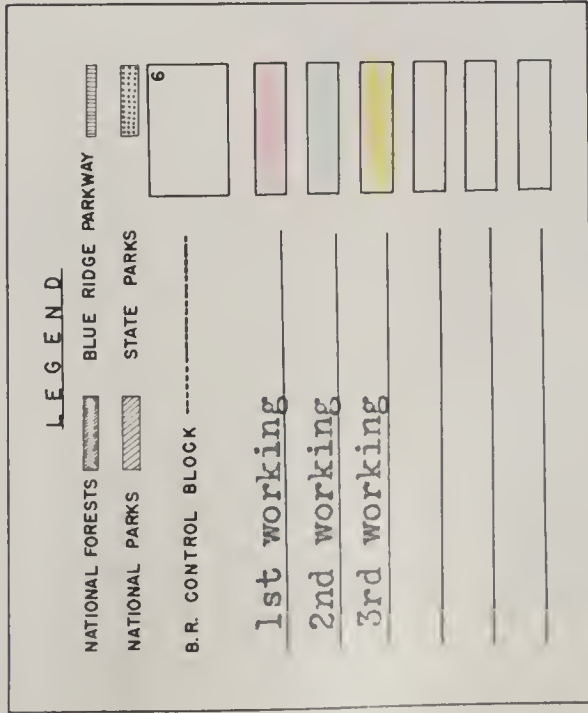
WHITE PINE BLISTER RUST CONTROL

MAP DESIGNATES: Status
(STATUS-PROGRESS-WORK PLAN, ETC)

STATE, VIRGINIA

DATE REPORTED: 12/31/48

SCALE IN MILES



WHITE PINE BLISTER RUST CONTROL

MAP DESIGNATES: **Status**

(STATUS-PROGRESS-WORK PLAN, ETC)

DATE REPORTED: 12/31/48

STATE: NORTH CAROLINA

LEGEND

NATIONAL FORESTS

NATIONAL PARKS

B.R. CONTROL BLOCK

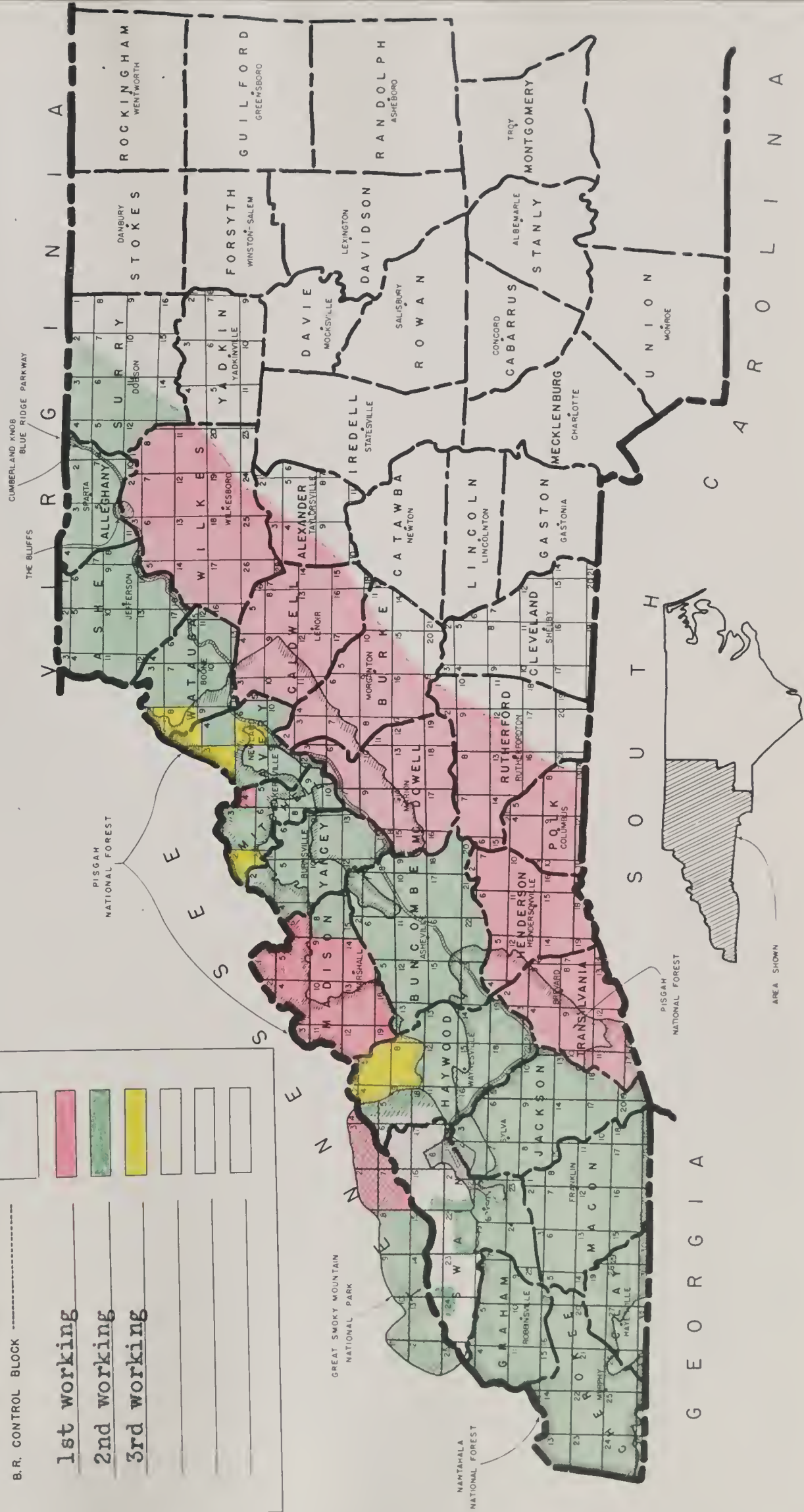
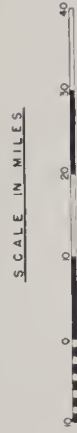
BLUE RIDGE PARKWAY

INDIAN RESERVATION

1st working

2nd working

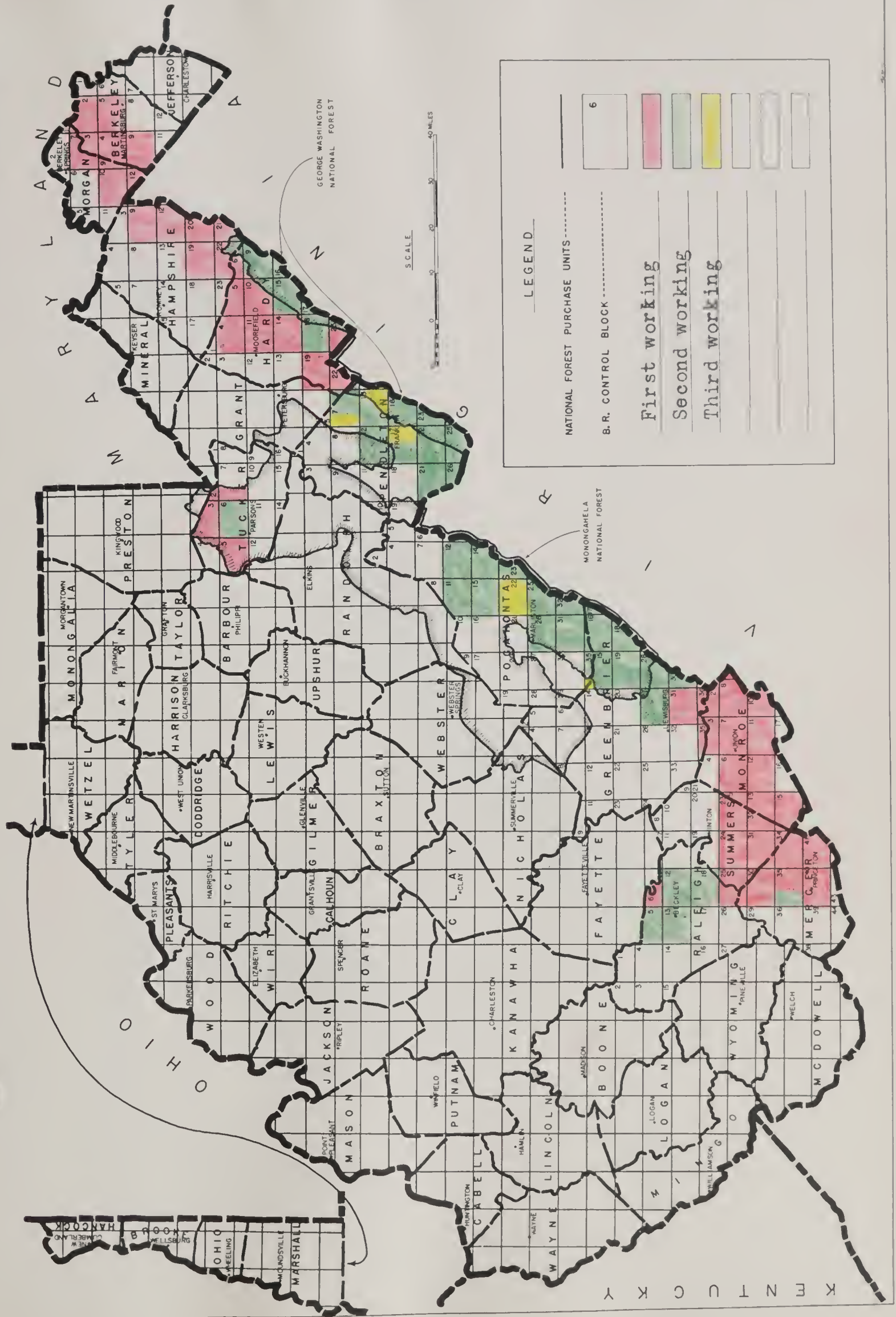
3rd working



Status

MAP DESIGNATES: STATUS
(STATUS-PROGRESS-WORK PLAN, ETC.)

DATE REPORTED: 12/01/40



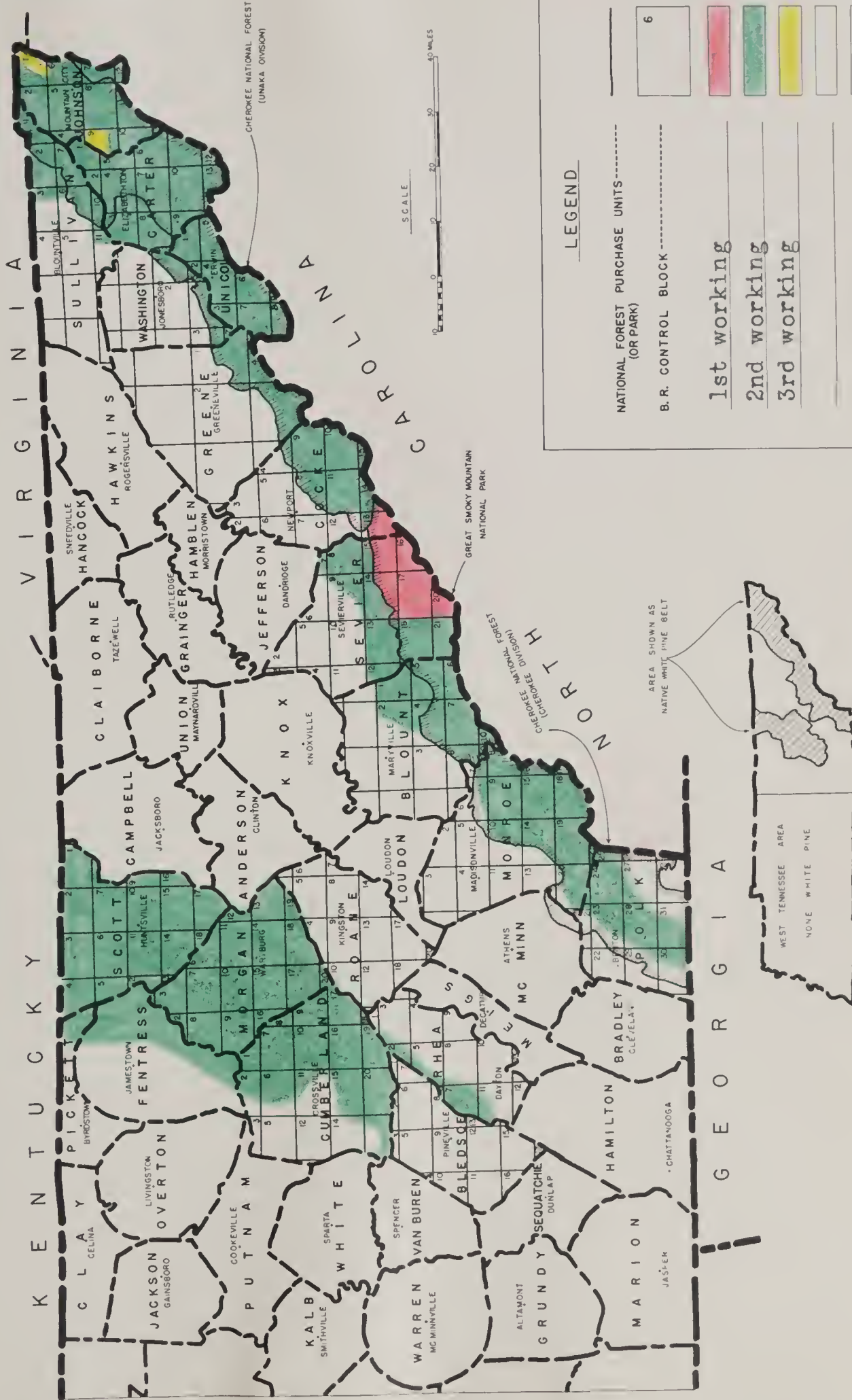
WHITE PINE BLISTER RUST CONTROL

Status

MAP DESIGNATES (STATUS-PROGRESS - WORK PLAN, ETC.)

STATE: TENNESSEE

DATE REPORTED: 12/31/48







WHITE PINE

GEORGE WASHINGTON NATIONAL FOREST

REPORT OF RANGER DISTRICT SUPERVISOR ON NATIONAL FORESTS - 1948

White pine blister rust control work on National Forests made in the Southern Appalachians has now reached a point where eight of the nine National Forests which fall or partially fall within the blister rust control area are on maintenance.

The largest acreage which is not yet on maintenance is on the George Washington National Forest and it will be necessary to have a sizable blister rust program for several more years before this forest can be placed on a full maintenance program. Even when that time does come the yearly maintenance work on this forest will be greater than the combined maintenance work for all the rest of the forests in the region.

Summary of Blister Rust Control Work On The George Washington National Forest

During the year resurvey was completed in Shenandoah and Rock Counties. Ribes eradication work was carried on in the Lee and Dry River Districts in Virginia and West Virginia and the Deerfield and Warm Springs Ranger Districts in Virginia. A summary of the work for the year 1948 is shown on Table 23, page 50, and the status of ribes eradication for the years 1932 through 1948 appears on Table 24, page 51. The present status of control by Ranger District is as follows:

TABLE 23
Status of Control By Ranger Districts
(Acreage Approximate)

District	Acres of White Pine	Acres Control			Acres On Main- tenance	Percent For Control Surveyed
		Worked	Not Worked	Total		
Lee	12,243	20,096	-	20,096	27.70	100
Dry River	68,703	126,765	14,183	140,948	49.397	100
Deerfield	51,030	100,173	10,164	110,337	71.982	100
Warm Springs	18,860	43,604	5,593	49,197	28.442	100
James River	11,012	19,770	-	19,770	18.554	20
Bedlar	14,342	19,991	571	20,562	19.754	10
TOTAL	164,750	339,599	27,513	367,112	185.682	

Control records are maintained by county and ownership and some estimates were made where one county included parts of two or more ranger districts.

White pine resurveys should be completed in the James River District during 1949. The only resurvey in the Pedlar District was a part of Amherst County in 1940. Some ribes eradication work was carried on by the Blue Ridge Parkway between Tye River Gap and Clarke Gap. We hope to resume work in this district during the winter of 1949-1950.

Good progress was made during the year on ribes eradication. The records now show slightly over 22,000 acres which have been resurveyed but on which eradication work has not been performed. Last year this figure was slightly in excess of 30,000 acres. Although labor rates were increased and costs of operations were high the cost of ribes eradication on a per acre basis was lower than it was in 1946 and 1947. This was mainly due to increased production. The present indications are that the survey will be completed or nearly so by the end of the next fiscal year. By that time a considerable amount of necessary ribes eradication work will likely remain. The work during the year has been under the immediate direction of Mr. G. L. Cramer, who is assisted by E. A. Rodamer, M. Q. Miller and H. G. Simons. In West Virginia the work on the forest is supervised by C. M. Falts and D. L. Gillispie. A rotating work schedule is being prepared for those portions of the forest on which the status is fairly well known. A considerable amount of study and time will be required in preparation of this but it is hoped that by the time the resurvey is completed on the forest we will be in position to accurately estimate the needs for maintaining control in the future.

NATIONAL FORESTS NOW ON MAINTENANCE

(Listed according to priority of maintenance work to be done)

1. The Monongahela National Forest:

This forest has over 11,000 acres of ribes-bearing lands within the best white pine sections of the forest. All second work was completed in 1947. During the 1950 fiscal year a small post checking program is planned which will cover all the better white pine areas and those areas which had the heaviest ribes concentrations. Blister rust is lightly scattered throughout the forest.

2. The Jefferson National Forest:

All second and white pine surveys were completed on the Jefferson National Forest in 1948. Ribes regeneration was not heavy following the forest work in 1937 and 1938, and many areas examined 3 to 4 years following the second working have shown little or no ribes comeback. However, there are a number of good white pine areas which will need attention, especially since the rust is present in small scattered areas.

The blister rust has been found on one or both hosts throughout the white pine range of the forest. Little if any commercial damage has been found. The infections on white pine are small in extent and widely scattered. There is sufficient infection on white pine within and near the forest area that rust can be expected on ribes about anywhere or any year. This in itself is not necessarily serious since the ribes population on the better white pine areas has been reduced to a point where little - if any, damage to the pine will likely take place.

It does not appear likely that any great amount of work will be necessary for a few years. The exact operation of the maintenance program has not yet been determined. However, for the present we can assume that it may be somewhat as follows:

(a) Periodic examinations should be made of the ribes-bearing control areas on the forests, preferably by a representative of the Bureau and the district ranger or another representative of the Forest Service. When the ribes regeneration seems to indicate the need for a formal check, such program should be set up accordingly.

(b) Definite arrangements should then be made for ribes eradication where it is found necessary. When eradication work is completed an estimate should again be made of the approximate time to begin renewed examinations to determine the need for another working. Just how frequently reworking will be necessary cannot be determined at present but it will likely be five to fifteen or more years. This work should be scheduled by large areas, perhaps ranger districts or similar working units.

The major problem areas of the Jefferson National Forest are as follows:

(a) Iron Mountain - This consists of the mountain range generally following the northern boundary of Grayson County and includes parts of Grayson, Washington, Smyth, Wythe, and Carroll Counties in the Halsted and Wythe Ranger Districts.

(b) A few areas in Blaine and Forest Counties in the Wythe Ranger District.

(c) A few areas in Buchanan and Boone Counties in the Glenwood Ranger District. These areas are on the western slopes of the Blue Ridge Mountain range.

Wild ribes are present over large parts of the New Castle Ranger District but have been found in association with valuable white pines. No work will likely be needed in this ranger district for many years. This situation, however, can change rapidly either through land acquisition or the natural spread of white pine into ribes-bearing

country. At the same time a post check was made in a given ranger district the Bureau maps should be corrected to include any land acquired by the Forest Service since the time of the last working. In the event of any major acquisition program this would be desirable more frequently. The Bureau representatives should work in close cooperation with the Forest Service in an attempt to see that each district ranger is reasonably familiar with the white pine and ribes distribution in his district. The ranger should also have a good working knowledge of the blister rust and the methods for controlling it. This will require some effort on the part of the Bureau representatives since the district ranger's duties are widely varied and numerous.

The following table shows the status of the white pine and the control work by ranger districts on the Jefferson National Forest.

TABLE 22

Status of Control By Ranger Districts

Ranger Districts by Location	Acres White Pine	Acres Control		Maintenance	Not On Maintenance
		Ribes Free	Sites Bearing		
CLINTON DISTRICT					
Botetourt	7,818	12,800	505	13,305	-
Rockbridge	1,635	4,361	210	4,461	110
Sub-Total	9,453	17,161	715	17,766	110
NEW CASTLE DISTRICT					
Botetourt	676	1,590	-	1,590	-
Craig	3,780	11,822	-	11,822	-
Giles	161	1,039	-	1,039	-
Montgomery	2,986	6,195	-	6,195	-
Shenandoah	117	247	-	247	-
Sub-Total	7,720	20,893	-	20,393	-
STONE MOUNTAIN DISTRICT					
Giles	530	740	-	740	-
Shenandoah	1,624	5,523	70	5,523	70
Talbot	2,284	7,757	7	7,764	-
Waynes	11,105	12,759	4,103	16,862	954
Jefferson	2,424	3,896	-	3,896	-
Rockbridge	3,753	5,798	1,340	4,172	472
Sub-Total	21,420	36,673	6,320	38,223	1,496
FOREST SERVICE DISTRICT					
Jefferson	5,192	9,004	3,217	10,007	2,214
Shenandoah	8,532	11,931	1,165	12,666	430
Rockbridge	2,632	1,959	1,730	3,334	355
Sub-Total	16,356	22,894	6,112	26,007	2,999
TOTAL	44,229	76,928	12,957	100,896	4,605

3. The Pisgah National Forest:

The summary of control for the year 1948 is shown in Table 60, Page 40.

The work during the year consisted of rust checking and ribbon eradication work in the vicinity of Figeo River in Haywood County. At the time of the previous working several heavy concentrations of willow ribes were found. A relatively light comeback of blisters was noted on the post checks. Since this area is inaccessible and a camp had to be established for the checking crew near the area, some eradication work was carried on over though it appeared that perhaps it could well have been postponed for a few seasons. This work was carried on during the early spring season and it is believed the willow ribes potential has been reduced to a point where no further examinations will be necessary for several years. Perhaps it is well that the eradication work was performed since during the late summer we found that there was a wide spread wave of rust throughout Haywood and several nearby counties in North Carolina and Tennessee.

The blister rust was found for the first time in eight counties in North Carolina and three in Tennessee. Those in North Carolina were Mitchell, Yancey, Buncombe, Madison, Haywood, Transylvania, Swain, and Graham. The amount of infection was generally light but in some cases the infection spots were found relatively close to each other. Although no infection has been found on white pine in any of these counties we suspect that some may be present.

The major white pine producing areas are adequately protected for the present. There are only two problem areas on the Pisgah National Forest, namely, Figeo River and Nolichucky River. The latter of these was checked and worked last year. Even with the rust being present it is not believed that any additional work will be required on the Pisgah for several years.

In the meantime continued scouting for the blister rust should be carried on each fall. The Forest Service personnel can be of great assistance in this work without materially interfering with their own duties. If time permits a casual examination should be made of the ribes-bearing areas to determine the need for a systematic examination or post check. Here again the rangers and other Forest Service personnel should participate insofar as possible. The forest, for the most part, may be regarded as on maintenance which will mean that in the absence of any major land acquisitions, control of the rust will amount to periodic examinations of the control areas, detailed examinations when the ribes appear to be re-establishing themselves, and eradication of such blisters that come back. This will probably require a Forest Service eradication program at long intervals, perhaps five to fifteen years.

4. The Cherokee National Forest

Some post checking work should be done during the 1950 fiscal year on the Cherokee National Forest, especially in the Watauga and Unaka Districts. This program would fit in very well with the work on private lands in the eastern part of the State. It is not contemplated that very much ribes eradication work will be needed but enough work should be done on all priority white pine areas known to fall on ribes-bearing land. This is especially true of white pine plantations. White pine is on the increase and reconnaissance should be maintained to keep check on the spread of white pine reproduction on the higher mountain slopes where ribes are more abundant.

5. The Chattahoochee National Forest:

This forest has been on maintenance since 1946 when the last working was completed. Fortunately there are very few white pine areas on the forest which are associated with wild ribes. Ribes regeneration has not been excessive on the few control blocks in the forest but it was indicated from a few general checks made in the spring and fall of 1948 that systematic post checks should be made during the 1950 fiscal year on the Grassy Mountain and Wolfe Pen Gap areas.

6. The Nantahala National Forest:

The status of control work is in Table 24, Page 51.

No systematic work was carried on on the Nantahala National Forest this year since this forest is now on maintenance. Extensive scouting for the blister rust was carried on throughout the purchase area and the rust was found in only one location, this being on Santestlah Creek in Graham County. Many infections were found in the Great Smoky Mountains National Park, a few in Haywood County and one in the northern portion of Transylvania County. The present technical staff of the forest has shown considerable interest in blister rust and its control and we believe they will continue the excellent cooperation they have shown in the past. Present indications are that the future requirements to maintain the control of the disease will be somewhat as follows:

Extensive scouting should be carried on next fall and perhaps for a few years thereafter to determine the spread of the rust on ribes. A large amount of this can be done by the present Forest Service personnel with the assistance of the Bureau with very little loss of time from their other duties. Additional information is desirable on the ribes distribution even though there is no white pine in the immediate vicinity. It is recommended that the Bureau discuss this matter in some detail with the Forest Service personnel to arrange the details whereby such information will be collected and reported with a minimum of interference with the Forest Service's other duties. Periodically field

examinations should be made of areas which may require intensive work and should additional work be found necessary arrangements made for carrying it out. Such examinations should be made by representatives of the Bureau and Forest Service.

7- The Cumberland National Forest

Although there are some excellent stands of white pine in the Red River District of the Cumberland National Forest the danger from blister rust damage is practically absent. Two surveys have been made on this forest and only a few small pockets of wild ribes have been found. The ribes-bearing areas worked amounted to 65 acres on which only 49 ribes were found and destroyed. From our surveys and through general reconnaissance it can be assured safe to grow white pine anywhere on the Cumberland National Forest. This forest is now on a permanent maintenance status as far as blister rust control work is concerned.

8- The Smelter National Forest

A small portion of the General Pickens District contains some excellent white pine. This section of the forest has had two surveys in the past 14 years and no wild ribes were found either time. The white pine blister rust control area on this forest is on permanent maintenance.

TABLE 23

Summary of Ribes Eradication on National Forest Lands - 1948

(Operating Agency - U. S. Forest Service)

National Forest	Ribes Working	Acres Worked		Ribes Destroyed	Man-Days On Ribes Eradication	Acres Worked Per Man-Day	Ribes Pulled Per Acre	Acres Blocked Out As Ribes-Free (Survey & Post Check)	
		Second Working	Other Workings					Acres	Man-Days
Adirondack	21,075	6,520	3,518	31,115	8,900	5.2	30.0	51,742	630
Appalachian	1,500	820	-	2,580	62	29.0	2.0	58,770	500
Black Hills	-	237	-	237	30	18.8	7.2	713	5
Brainerd	-	-	113	113	31	3.3	7.8	2,100	17
TOTAL	22,600	7,340	3,631	33,645	9,023	5.6	9.3	111,825	1,105

TABLE 24

Status of Ribes Eradication on Forest Service Lands, 1932 - 1948, Incl.

National Forest	Total Acres		Acres Worked			Ribes Destroyed	Man-Days	Acres On Maintenance	% On Maintenance	Un-Worked Average	Average Acquisition Cost Per Acre
	Acres White Pine	Acres Control	First Working	Second Working	Other Working						
Geo. Washington	164,750	307,012	339,399	45,148	14,911	2,537,580	29,361	265,686	78	27,613	70.713
Jefferson	55,084	107,474	107,474	3,737	856	327,701	1,831	102,873	96	-	3.605
Monongahela	46,854	89,929	89,559	11,606	121	312,627	5,240	80,628	90	370	8.951
Cumberland	16,980	32,002	32,002	65	65	49	336	32,002	100	-	-
TOTAL F.S. Reg. 7	283,668	596,417	568,434	60,556	15,953	3,177,957	36,768	481,185	85	27,085	87.249
Pisgah	79,829	156,132	156,132	2,918	1,555	65,596	1,321	150,317	97	10	4.005
Nantahala	42,083	63,151	62,716	-	-	-	45	62,709	99	435	-
Cherokee	250,378	484,572	484,572	2,103	1	1,997,007	11,799	481,266	99	-	3.309
Sumter	18,794	53,862	53,862	3,700	-	-	382	53,862	100	-	-
Chattahoochee	295,902	349,903	349,903	330	-	11,491	2,931	349,713	99	-	1.90
TOTAL F.S. Reg. 8	686,986	1,106,620	1,106,175	9,051	1,556	2,072,094	16,478	1,097,867	99	145	6.509
TOTAL NATIONAL FORESTS	970,654	1,703,037	1,674,609	69,607	17,509	5,250,051	53,246	1,579,052	94	28,423	95.357



WHITE PINE - BLUE RIDGE PARKWAY

NATIONAL PARKS

IN

SOUTHERN APPALACHIAN REGION

Introduction

White pine blister rust control work on the National Parks of the Southern Appalachian Region is approaching maintenance. Some additional work will be required on the Blue Ridge Parkway particularly in those sections on which the grading has not been completed. The white pine along the Parkway from Adney Gap, Virginia to Blowing Rock, North Carolina is seldom excelled from an aesthetic point of view anywhere in the region. The white pines of the Great Smoky Mountains National Park are also of major importance. The rapid growth of white pine in the Catalochee section of the Park is particularly impressive. On the 67,000 acres of white pine area in the Great Smoky Mountains National Park there are found many unusually large white pine which are worth preserving at almost any cost. Fortunately the wild ribes are generally light to absent in the most important areas of the Blue Ridge Parkway and the Great Smoky Mountains National Park. The work in the Shenandoah National Park has progressed to a point where the ribes population has been effectively reduced within the control areas. The ecological conditions, however, are frequently so favorable for the growth of wild ribes that intensive work will be required for several years.

As the basis for determining what areas are placed on maintenance, the following definition was prepared primarily for the Great Smoky Mountains National Park but it is believed that it will generally apply to all of the Park Service holdings in the region.

Maintenance - Surveyed white pine and control acreage which is:

1. Free of wild ribes and cultivated ribes removed and checked.
2. Wild ribes-bearing control area on which the live stem has been reduced to 25 feet or less per acre, and the estimated ribes regeneration will not require attention for about 5 years.
3. Potential or surveyed white pine areas free of wild ribes on which cultivated ribes were removed and checked. This acreage does not appear in the records.

GREAT SMOKY MOUNTAINS NATIONAL PARK

Status of Control

As a result of the survey work during 1948, we now have over 67,000 acres of white pine in the control area of over 109,000 acres. This represents a slight increase over the 1947 figure, most of which was additional white pine found in Swain County, North Carolina. The over-all status of the control work is shown on Table 27, page 63.

Blister rust was reported for the first time in the Park on August 25, 1948 by James B. Light, Assistant Chief Ranger. Intensive scouting over most of the known wild ribes areas of the Park during the following few weeks showed infection at 16 locations. All of the rust found was on wild ribes and was located along the Appalachian Trail. It was generally distributed from the point near Brier Knob to Mt. Sequoyah. This was apparently a part of the long-distance spread which occurred in western North Carolina and eastern Tennessee during the year. The rust was found for the first time in eight counties in North Carolina and three in Tennessee. The details regarding the locations of the various infections are on file in the Superintendent's office of the Park. No infection on white pine had been found in the Park nor any further southward than that indicated in the 1947 annual report. It is to be expected, however, that there are now, or will develop within the next few years, small centers of the infection near or possibly within the Park. This in itself does not mean that there will be any appreciable loss of white pine from the disease but it does mean that blister rust is an immediate and definite hazard rather than one which we could expect at some future time.

Blister Rust Control Work During 1948

The work during 1948 is summarized in Table 26, page 62 of this report. In addition to ribes eradication it will be noted that a re-survey was conducted on 8,625 acres. All of the ribes pulled in Tennessee were cultivated bushes found at abandoned homesites. Eradication of wild bushes were confined to the Cataloochee drainage area. The cultivated bushes were pulled in the drainage area of Little River, the west prong of Pigeon River and Cades Cove. An attempt is being made to examine all of the homesites in the Park. This work is limited to a period of about two weeks each spring. The locations where bushes are found during a given year are reexamined during the following year. It is significant to note that in 1947 there were 373 bushes destroyed at 257 homesites. During the reexamination in the spring of 1948 only one missed bush was found. This indicates very thorough work on the part of the men during 1947.

A considerable amount of time was spent in scouting for the blight rust after it was first reported. This work was carried on by the Ranger Staff insofar as their normal duties would permit, but the most intensive scouting was carried on by Mr. Whaley and his crew. Practically all of the Appalachian Trail and nearby ribbon-bearing areas between Davenport Gap and Person Bald were scouted. In addition to the scouting, some considerable information was secured regarding the distribution of wild ribes in these high elevations.

Other significant locations of wild ribes were found during the year. Perhaps the most important were in the vicinity of Shavers Fork, West Virginia, and one other location between Fontana Lake and the present Park Service holdings in the vicinity of Great Creek. No wild ribes had been reported at or near any of these locations previously. With the rust now being found in the Park it becomes even more important that we secure all possible information regarding these widely scattered and somewhat isolated pockets of wild ribes.

Costs

During the year there was spent a total of approximately \$8,250. There remains a balance of about \$2,780.00 available for labor and operation between January 1 and June 30, 1949. The costs remained high during the year due to the present wage scale. This, however, is a condition which is beyond the control of the Park Service. The operating costs were relatively low this year since no major purchase of equipment has been made. The average cost on a per acre basis for time, material and survey was \$6.06.

Work Schedule for 1949

During 1949 every effort should be made to complete the survey of the present known white pine areas in the Park. All that remains to be done is to survey the area between the line and section of the following areas: Twenty Mile Creek, part of Sugar Creek, and all of the area on the west side of T.V. 4, between Fontana Lake and the Park. It is proposed that this land will be transferred to the Park but this has not been accomplished as yet.

A careful pine check and in some cases survey of the white pine should be made in the Catawba River drainage area. This area is largely on the border of the Park and is being rapidly reduced through logging and by suppression of the fire. The best time to make a survey is in the early spring when the ribes are in leaf and before most of the other deciduous and herbaceous plants have formed their leaves.

The work of checking homesites for abandoned cultivated bushes has progressed very well in the better white pine areas of the Park. However, this should be extended to include the entire Park as time permits.

At least two weeks should be tentatively set aside for the entire crew to spend on scouting for blister rust next fall. The same method employed during 1948 is believed satisfactory but it should be extended to cover the known wild ribes-bearing areas of the Appalachian Trail and in addition, the other major ribes-bearing areas such as Mt. Sterling Ridge, Balsam Mountain, Shuckstack and High Focks. This type of scouting should be continued for at least a few years.

An attempt should be made during 1949 to prepare a maintenance work schedule for the Park. Just what this will be cannot at present be determined but would likely develop into a rotation covering the summer season only.

THE SHENANDOAH NATIONAL PARK

White Pine Blister Rust

No increase in the range of infection has been noted over the past year. The center of infection remains in the central part of the Park north of Big Meadows, with an isolated area at Elkwallow Gap.

Status of Control

White pine blister rust activities during 1948 consisted of ribes reeradication, post checking and resurvey work. The status of blister rust control on the Park is found on Table 27, page 63. There are over 9,700 acres remaining to be reworked and some 1,100 acres needing initial work. Initial work is 93% complete with 41% of the control area on maintenance.

The acreage on maintenance increased from 1,754 to 6,704 acres, the result of recalculation from the records in the light of the present definition of maintenance. This term is still somewhat flexible but may be regarded as follows:

Surveyed white pine and control which is (1) free of wild ribes and cultivated ribes removed and checked, (2) wild ribes-bearing control area on which the live stem has been reduced to 25 feet or less per acre, and the estimated ribes regeneration will not require attention for about five years.

The status of the original 59 white pine areas at the year's end is as follows

Areas definitely retained	40
Areas retained tentatively	5
Areas abandoned	13
Areas combined	1

Blister Rust Control Work -- 1948

During the year resurvey work was conducted on 2,240 acres at Elkwallow Gap, Area #17, of which 1,119 acres contained white pine. In addition post checking was carried out on 390 acres in the Pinnacles and Hawksbill Creek areas.

Ribes eradication work was performed on six areas. A summary of this work will be found on Table 26, page 62.

The services of one SP-5 checker, two crew leaders and up to seven laborers were used through the period of ribes eradication. Two checkers were used during the off season periods on resurvey and checking work. During the year a total of \$3,233.95 was expended and 551 labor man-days were used on all phases of the blister rust control work program.

Work Schedule for 1949

During 1949 it is planned to resurvey 1,650 acres on Elkwallow Gap area, Fork Mountain, Ivy Creek, Dean Mountain, Naked Creek and Powell Mountain. A reconnaissance survey indicates that there may be sufficient white pine between Pignut Mountain and Elkwallow Gap worth protecting to completely join these two areas.

The following areas are scheduled for post checking:

Spitler Pine	President's Camp
Big Run	Moorman's River
Pass Mountain	Hazel Mountain
Elkwallow Gap	Gap Run

Ribes eradication is planned for the Pinnacles and Hazel Mountain areas and other areas to be determined before the spring eradication season.

Arrangements will be made to do as much ribes eradication work as possible during the early spring season when the leaves first appear on the ribes. It would be ideal if our eradication work could be performed between April 15 and about June 15. The blister rust checker should begin work a few weeks before this period in order to lay out the work blocks, employ laborers, make arrangements for transportation, camp, or any other details. This would enable him to begin work at the earliest date with the maximum number of men.

During the year Park Ranger L.Y. Berg, who has been in charge of the Park's blister rust program since the transfer of Assistant Chief Ranger R. B. Moore, was promoted to District Ranger, Central District of this Park. Park Ranger J. W. Howell assumed the responsibility for carrying on the program under the guidance of Mr. Berg. Mr. Fields Benton is foreman in charge of the field work but divides his time between blister rust control and fire control.

Although the system of operating on blister rust control for seven months of the year and fire control for five months has worked out fairly well, it would be advisable if the two activities could be separated. The reason for this is that the spring of the year is the best time to conduct post checking and ribes eradication and since the spring fire season falls during the same period, blister rust control often has to be delayed until the end of the fire season. If possible, blister rust control work should be timed with the season and not curtailed because of fire control activities.

BLUE RIDGE PARKWAY

Status of Control

Most of the white pine areas along that part of the Blue Ridge Parkway which is now graded may be regarded as on maintenance. The amount of white pine on the ungraded portions of the Parkway is not definitely known. However, from previous surveys the following information was secured.

Section 1-G: White pine is believed to be present along most of this section but so far as we know it is free or practically free of wild ribes.

Section 1-L: Very little if any white pine is present and probably no wild ribes.

Sections 1-M and 1-N: Some white pine is known to be present. Probably a few wild ribes may be found in association with white pine.

Section 2-G: Some white pine is present, particularly on the Cone estate. Some wild ribes are likely present particularly on the southward portions of the section.

Section 2-H: Little, if any, white pine will be found on the proposed Parkway north of Route U.S. 211 and wild ribes are generally distributed.

Section 2-P Thru 2-Z: The white pine and ribes situation is generally unknown.

Section 1-B thru 1-F Preliminary examination or survey completed.
Section 1-H thru 1-N

Sections 1-P Thru 1-W: Preliminary examinations and eradication of cultivated ribes performed.

Sections 2-A through 2-E White pine survey and eradication of wild
Parts of 2-F & 2-K and cultivated bushes completed.

Section 2-G thru Section 2-R Eradication work completed. (This work, "Cone Estate" having been performed some years ago, was not performed according to Park Service standards and therefore is subject to careful review.)

Eradication work was performed on the following areas:

- Tye River Gap (Section 1-D)
- Irish Gap (Section 1-E and 1-F)
- Clark Gap (Section 1-F)
- Petiets Gap (Section 1-M)
- Wilkerson's Gap (Section 1-J and 1-K)

Survey has been completed on Rocky Knob, Linville Falls, Peaks of Otter, Cumberland Knob and the Bluffs. Eradication is also completed on all of these areas except the Peaks of Otter and the wild bushes on Rocky Knob. The eradication of these bushes is being postponed pending the completion of the development plans of these areas.

Work in 1948

No ribes eradication work was considered necessary during 1948. A preliminary examination was made by representatives of the Park Service and the Bureau of Sections 1-M and 1-N. It was decided to postpone any detailed survey work until grading is completed on these sections of the Parkway unless infection on the pines is found to be developing to a point where earlier work would be desirable.

Work Schedule for 1949

During 1949 the following work is proposed:

- (a) Examination of the Cone estate by representatives of the Park Service and the Bureau.
- (b) Examination of Sections 2-Q, particularly in the vicinity of Otter.
- (c) Post checking of Petiets Gap and Wilkerson's Gap and probably ribes eradication if found necessary during this year.
- (d) Since no detailed survey was made on Sections 1-P through 1-W, it is proposed to estimate the acreage of white pine largely for record purposes. There is no question but what there is an abundance of white pine to justify the cost of eradicating the cultivated ribes in these sections.

There remains a balance of \$1,150 available through June 30, 1949 with which to do this work.

Recommended Work After 1949 Fiscal Year

The fact that the Parkway is on maintenance does not mean that no future work will be required, but it is believed that the blister rust control problem will remain for many years but will never be a major project. As the various sections are graded, Parkway officials should determine by station and section the white pine that they consider of sufficient importance to protect. A detailed examination of these areas should be made and the necessary ribes eradication work performed unless it is found extremely costly, in which case such areas should be reconsidered.

We do not know of any major ribes eradication jobs which will arise as the construction is carried toward completion. However, this problem should be borne in mind. The present indications are that approximately \$1,000 per year will be sufficient to maintain adequate control of blister rust on the Parkway.

TABLE 25

Summary of Blister Rust Control on National Park Lands - By States

1932 through 1948

National Park	State	Total * Acres Worked	Ribes Destroyed	Acres On Maintenance	Acres Not Worked	Acres Needing Re-work
Shenandoah	Virginia	26,759	1,856,236	6,704	1,152	9,754
Blue Ridge Parkway	Virginia	3,437	21,339	1,545	-	1,036
	N. Caro.	8,060	561	8,060	-	-
	Total	11,497	21,900	9,605	-	1,036
Great Smoky Mountains	N. Caro.	26,527	99,983	24,716	-	977
	Penn.	83,667	573	83,667	-	-
	Total	110,194	100,556	108,383	-	977
TOTAL NATIONAL PARK SERVICE		148,450	1,978,692	124,692	1,152	11,767

* Includes initial, second and all other workings.

TABLE 26

Summary of Ribes Eradication on National Park Lands - 1948
Operating Agency - National Park Service

National Forest	Acres Worked			Ribes Destroyed	Man-Days On Ribes Eradication	Acres Worked Per Man-Day	Ribes Killed Per Acre	Acres Blocked Out As Ribes-Free (Survey & Post Check)	
	First Working	Second Working	Other Workings	Total Workings				Acres	Man-Days
Shenandoah	-	102	954	1,056	47	2.2	16.8	-	-
Front Range Mountains	246	-	35	281	137	1.9	115.0	8,615	830
TOTAL NATIONAL FORESTS	246	102	989	1,337	603	2.1	60.5	8,625	830

Summary of Work Accomplished on National Park and Indian Lands, 1932 - 1948, Inc.

National Parks	Total Acres		Acres Worked			Ribes Destroyed	Man-Days	Acres On Main-Tenance	% Main-Tenance	Un-Worked Acreage	Average Requirement Per Acre
	Acres Under Lease	Acres Owned by National Park Service	First Working	Second Working	Other Working						
Adirondack	6,669	17,610	16,453	6,463	3,838	1,856,236	20,817	6,704	41	1,152	9,734
Blue Ridge Parkway	4,300	10,641	10,641	856	-	2,900	659	9,605	90	-	1,052
Great Smoky Mountains	37,156	109,360	109,360	549	285	100,556	1,723	108,383	99	-	977
TOTAL NATIONAL PARKS	75,124	137,611	136,459	7,868	4,123	1,978,692	23,199	124,692	91	1,152	11,767

INDIAN LANDS *

Cherokee Resv.	27	445	445	-	-	-	-	445	100	-	-
TOTAL CHEROKEE RESERVATION	27	445	445	-	-	-	-	445	100	-	-
POTENTIAL OF INTERIOR	75,124	138,056	136,904	7,868	4,123	1,978,692	23,199	125,137	91	1,152	11,767

* All work on Indian Lands performed by Bureau.

WHITE PINE BLISTER RUST CONTROL

MAP DESIGNATES:

5. (STATUS - PROGRESS - WORK PLAN, ETC.)

SHENANDOAH NATIONAL PARK
(NORTH HALF)

DATE REPORTED.

12/31/48



LEGEND

SHENANDOAH NAT'L PARK BOUNDARY -

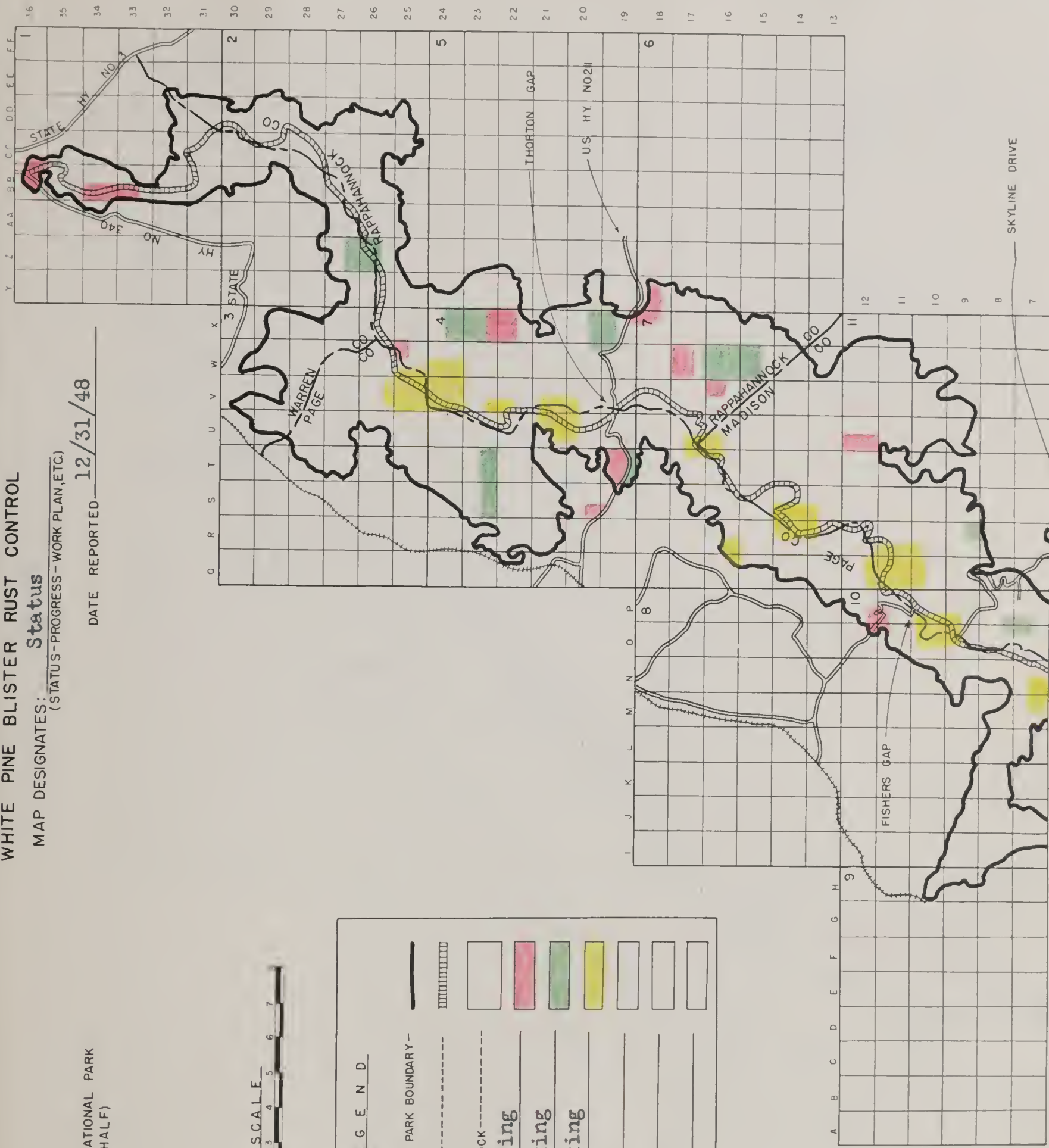
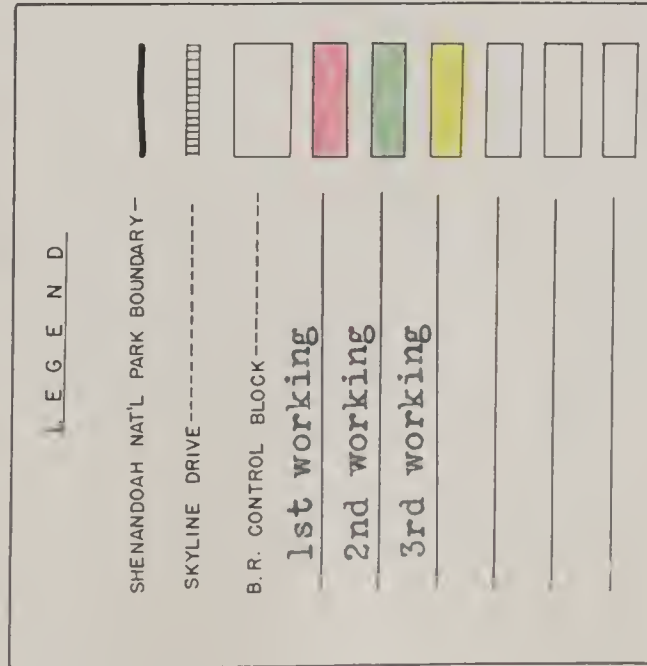
SKYLINE DRIVE-----

B. R. CONTROL BLOCK-----

1st working

2nd working

3rd working



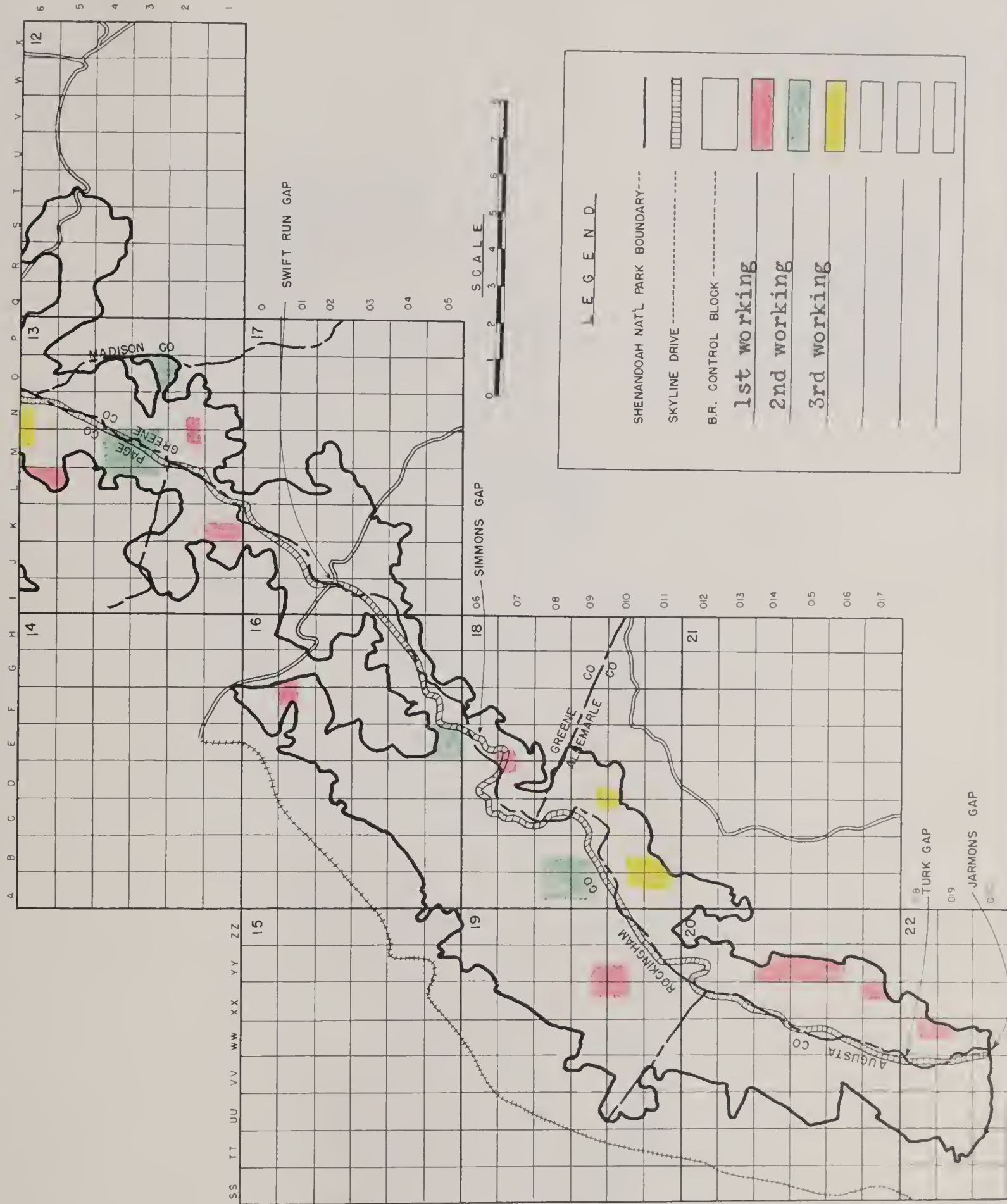
WHITE PINE BLISTER RUST CONTROL

MAP DESIGNATES: Status

(STATUS-PROGRESS-WORK PLAN, ETC.)

SHENANDOAH NATIONAL PARK
(SOUTH HALF)

DATE REPORTED: 12/31/48

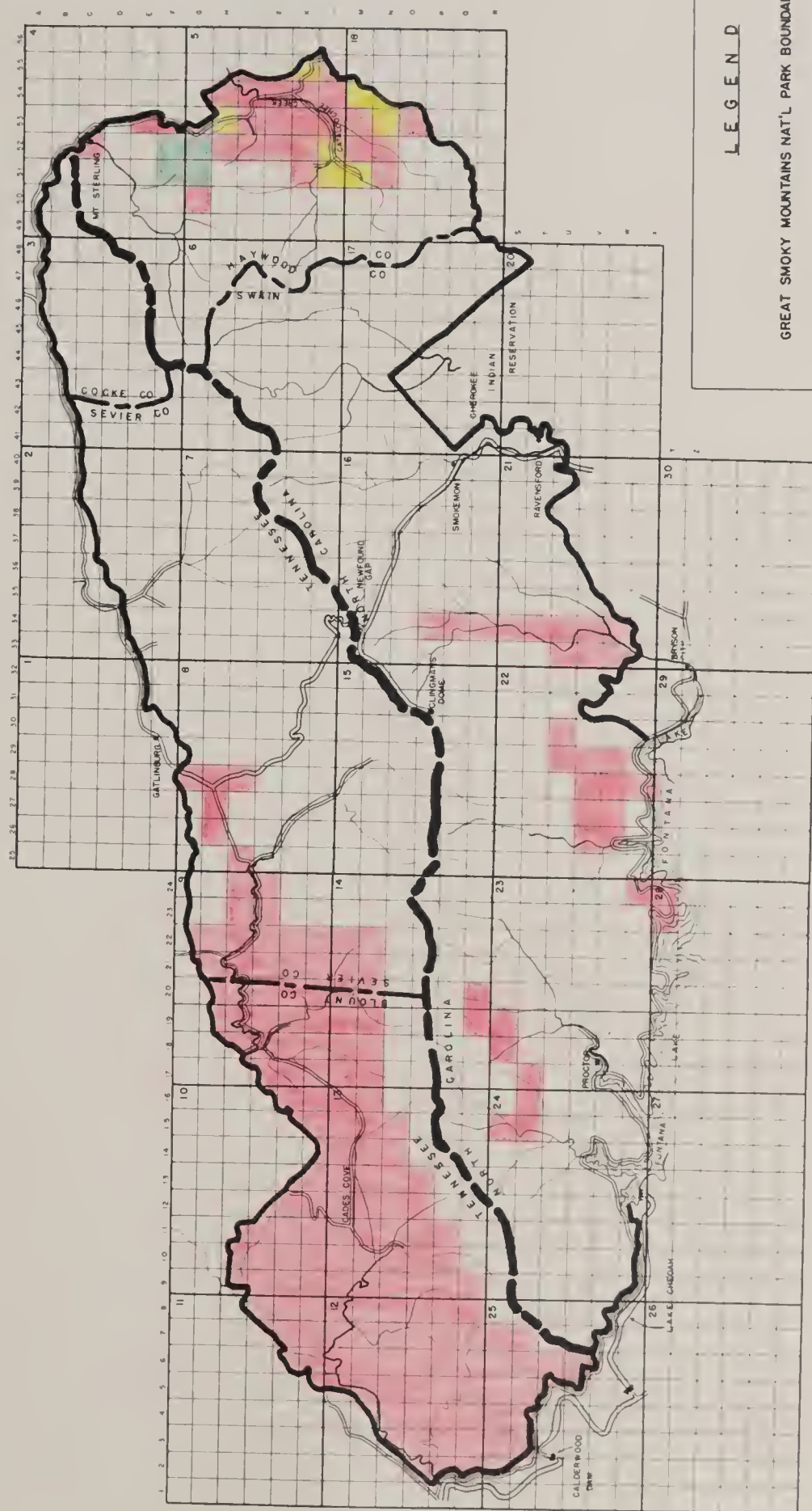


Status

MAP DESIGNATES: Status
(STATUS - PROGRESS - WORK PLAN, ETC.)

GREAT SMOKY MOUNTAINS NAT'L PARK

DATE REPORTED: 12/31/48



SCALES



LEGEND

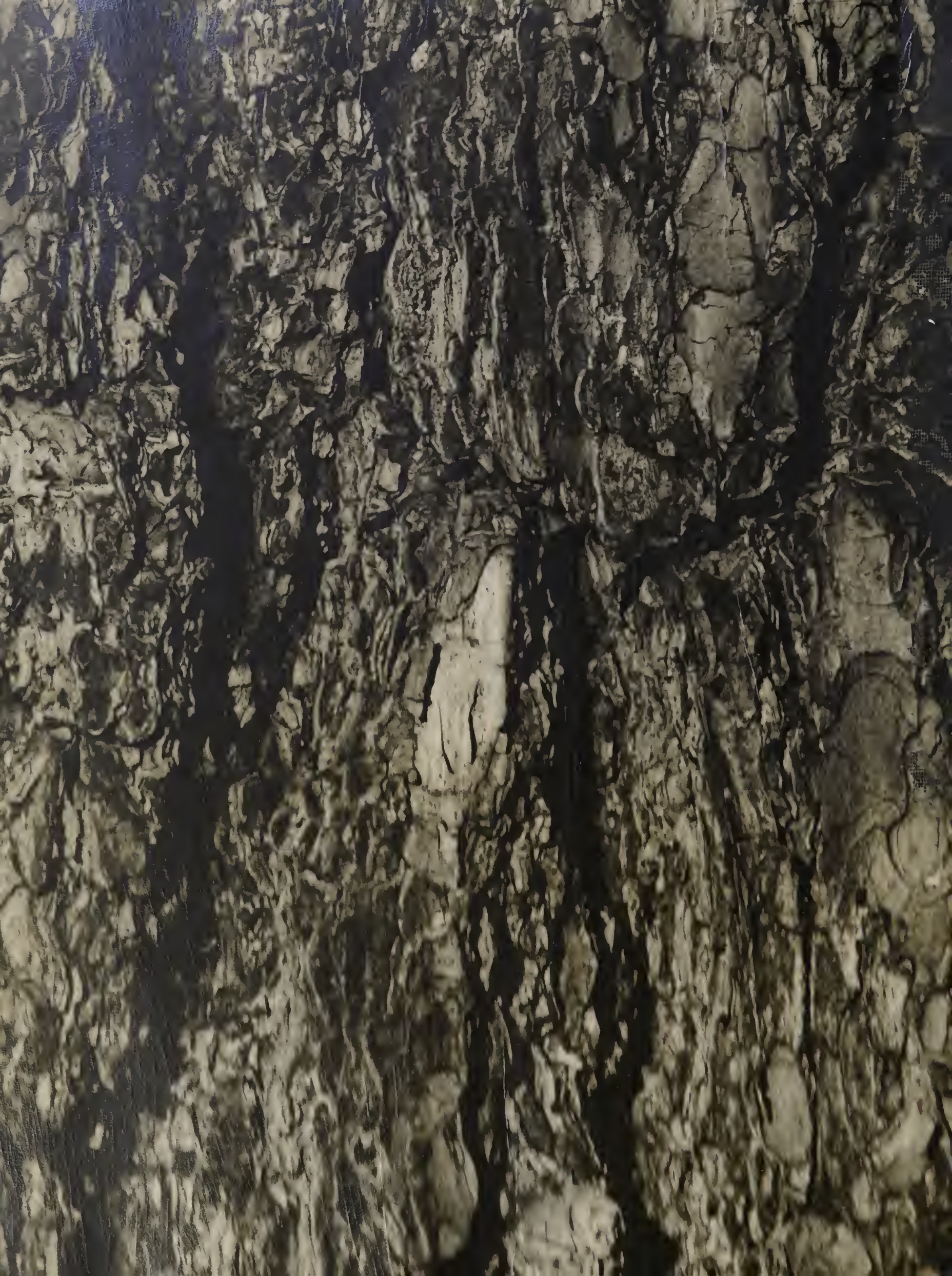
GREAT SMOKY MOUNTAINS NAT'L PARK BOUNDARY

B.R. CONTROL BLOCK -----

1st working

2nd working

3rd working



Report of
WHITE PINE BLISTER RUST CONTROL
NORTH CENTRAL REGION, 1948

by

Henry N. Putnam
Pathologist

and

J. K. Kroeber
Pathologist

BLISTER RUST CONTROL, NORTH CENTRAL REGION, 1948

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Summary of White Pine Blister Rust Control - December 31, 1948

NORTH CENTRAL REGION

White Pine Being Protected: Natural: 971,726 Acres; Planted: 159,761 Acres;
Total: 1,131,487 Acres. Estimated Value: \$120,000,000.

Status of Control (Net Acres)

I t e m	Forest	Indian	Nat. Park	State and	Total	Percent of Total
	Service (Acres)	Service (Acres)	Service (Acres)	Private (Acres)		
W.P. in Control Area	190,168	72,296	15	869,008	1,131,487	-
Total Control Area	387,766	125,053	120	3,424,187	3,937,126	100.0
Worked Initially	276,281	114,348	120	2,530,406	2,921,155	74.2
Worked Twice	134,582	61,605	-	824,535	1,020,722	25.9
Worked More Than Twice	33,283	26,224	-	130,421	189,928	4.8
On Maintenance	150,955	57,966	-	954,655	1,163,576	29.6
Needing Initial Work	111,485	10,705	-	893,781	1,015,971	25.8
Needing Rework	125,326	56,382	120	1,575,751	1,757,579	44.4

Local Control, All Agencies (Gross Acres)

W o r k i n g	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man- Days Used	Per Acre Ribes	Man- Days
	Calendar Year 1948					
Initial	26,836	79,780	648,697	6,178	8.1	0.08
Second	14,448	33,910	833,429	6,863	24.6	0.20
Third and Other	12,452	23,914	1,367,714	8,561	57.1	0.36
Total 1948	53,736	137,604	2,849,840	21,602	20.7	0.18
Cumulative, 1917 to 1948 (Gross Acres)						
Initial	1,039,354	3,384,699	222,545,270	878,543	65.8	0.26
Second	376,010	1,020,722	27,327,947	193,294	26.8	0.19
Third and Other	78,714	189,928	5,442,497	43,346	28.7	0.23
Total Cumulative	1,494,078	4,595,349	255,315,714	1,115,183	55.6	0.24

Blister Rust Infection: Found initially in 1948 on pine in one county each in Minnesota and Wisconsin. Known on pine and ribes in all seven States; on pine in 178 counties; on ribes in 390 counties of the 622 counties in the Region. Most severe in northern part.

Nursery Sanitation: One nursery in Ohio, three in Wisconsin worked in 1948. Ribes-free zones being maintained around 42 nurseries.

Canker Pruning, 1948: 19,301 cankers removed from 12,260 trees; 901 infected trees removed. Cumulative: 172,815 cankers removed from 79,954 trees. 3,208 infected trees cut down.

Surveying and Checking, 1948: 59,526 acres control area initially surveyed; 74,426 acres re-surveyed and 39,033 acres retained; 139,510 acres post-checked, and 107,988 acres retained; 49,665 acres given regular check.

Cultivated Black Currant Elimination, 1948: 5 plantings, 60 plants found; 15 plantings, 98 plants destroyed. Cumulative: 35,775 plantings, 295,358 plants found; 34,789 plantings, 288,740 plants destroyed.

Control Area Permits, 1948: 785 applications received in 4 States; 684 approved, 27 rejected; 74 voluntarily cancelled.

Summary of White Pine Blister Rust Control - December 31, 1948

ILLINOIS

White Pine Being Protected: Natural: 231 Acres; Planted: 1,712 Acres;
Total: 1,943 Acres. Estimated value: \$2,500,000

Status of Control (Net Acres)

Item	Non-Federal		Total	Percent of Total
	Public	Private		
White Pine in Control Area	1,111	832	1,943	100.0
Total Control Area	6,326	7,168	13,494	100.0
Worked Initially	6,212	5,053	11,265	83.5
Worked Twice	7,104	3,079	10,183	75.5
Worked More Than Twice	7,669	4,953	12,622	93.5
In Maintenance	1,188	1,149	2,337	17.3
Seedling Initial Work	114	2,115	2,229	16.5
Seedling Rework	5,024	3,904	8,928	66.2

Local Control, All by Bureau-State (Gross Acres)

Working	Acres		Acres Worked	Ribes Destroyed	Man- Days Used	Per Acre	
	White Pine Protected					Ribes	Man- Days
Calendar Year 1948							
Total	20		108	182	1	1.7	0.01
Cumulative, 1932 to 1948 (Gross Acres)							
White Pine	3,332		20,030	1,199,562	3,871	74.9	0.19
Ribes	2,285		10,183	610,042	2,512	59.9	0.25
Other and Other	2,756		12,622	533,996	3,509	42.3	0.28
Total, Gross Acres	8,373		42,835	2,343,600	9,892	61.7	0.23

Later Rust Infection; 1948: No new counties; Cumulatively found in north part of State on pine in 6 counties; on ribes in 24 counties; out of 102 counties in the State.

Nursery Sanitation: None worked in 1948. Ribes-free zones being maintained around 5 of the 8 nurseries originally protected.

Surveying and Checking, 1948: 108 acres of control area initially surveyed; 108 acres given regular check after ribes eradication.

Cultivated Black Currant Elimination: None in 1948. Cumulative: 532 plantings with 4,171 plants found; 60 plantings with 761 plants destroyed.

Summary of White Pine Blister Rust Control, December 31, 1948

INDIANA

White Pine Being Protected: Natural: 326 acres; Planted: 8,483 acres;
Total: 8,809 acres. Estimated Value: \$2,500,000

Status of Control (Net Acres)

I t e m	Forest Service	Non-		Total	Percent of Total
		Federal Public	Private		
W. P. in Control Area	18	2,487	6,304	8,809	-
Total Control Area	179	17,909	170,294	188,382	100.0
Worked Initially	179	16,573	59,687	76,439	40.6
Worked Twice	-	7,907	12,278	20,185	10.7
Worked More than Twice	-	3,190	2,780	5,970	3.2
On Maintenance	179	11,569	40,763	52,511	27.9
Needing Initial Work	-	1,346	110,597	111,943	59.4
Needing Re-Work	-	5,004	18,924	23,928	12.7

Local Control, All by Bureau-State (Gross Acres)

Working	Acres		Acres Worked	Ribes Destroyed	Man- Days Used	Per Acre	
	White Pine Protected					Ribes	Man- Days
Calendar Year 1948							
Initial	48	500	43	4	0.1	0.01	
Second	302	1,093	0	1	0.0	Tr.	
Third and Other	25	125	252	2	2.0	0.02	
Total, 1948	375	1,718	295	7	0.2	Tr.	
Cumulative, 1933 to 1948 (Gross Acres)							
Initial	8,655	87,933	436,577	3,907	5.0	0.04	
Second	3,626	20,185	92,179	1,036	4.6	0.05	
Third and Other	858	5,970	24,993	264	4.2	0.04	
Total, Cumulative	13,139	114,088	553,749	5,207	4.9	0.04	

Blister Rust Infection: 1948, No new counties. Known on pine in 3 counties;
on ribes in 53 counties of the 92 counties in the State.

Nursery Sanitation: None worked in 1948. Sanitation zones maintained around
2 of the 6 nurseries originally protected.

Canker Pruning: None, 1948; Cumulative: 4 cankers removed from 2 trees.

Surveying and Checking, 1948: 1,309 acres control area initially surveyed;
1,028 acres re-surveyed and 370 acres retained; 1,776 acres
post-checked, and 1,218 acres retained; 383 acres given regular
check after eradication.

Cultivated Black Currant Elimination: None in 1948; Cumulative: 5 plantings
with 20 plants found; 3 plantings with 15 plants destroyed.

Summary of White Pine Blister Rust Control - December 31, 1948

IOWA

White Pine Being Protected: Natural 714 acres; Planted 5,138 acres;
Total: 5,852 acres. Estimated value: \$11,000,000--chiefly as
shelterbelts.

Status of Control (Net Acres)

Item	Indian Service	Non-		Total	Percent of Total
		Federal Public	Private		
White Pine in Control Area	45	559	5,248	5,852	-
Total Control Area	500	3,408	46,133	50,041	100.0
Worked initially	500	3,388	30,345	34,233	68.4
Worked twice	206	2,078	4,991	7,275	14.5
Worked more than twice	-	934	363	1,297	2.6
On Maintenance	-	58	18,793	18,851	37.7
Needing Initial Work	-	20	15,788	15,808	31.6
Needing Re-Work	500	3,330	11,552	15,382	30.7

Local Control, All Agencies (Gross Acres)

Working	Acres	Acres Worked	Ribes Destroyed	Man- Days Used	Per Acre	
	White Pine Protected				Ribes Man- Days	
Calendar Year, 1948						
Initial	29	180	24,188	145	134.4	0.81
Second	63	236	21,643	136	91.7	0.58
Third and Other	16	89	5,669	49	63.7	0.55
Total	108	505	51,500	330	102.0	0.65
Cumulative 1933 to 1948 (Gross Acres)						
Initial	3,397	38,904	3,552,721	27,159	91.3	0.70
Second	1,050	7,275	663,055	5,126	91.1	0.70
Third and Other	307	1,297	115,756	1,117	69.2	0.86
Total, Cumulative	4,754	47,476	4,331,532	33,402	91.2	0.70

Blister Rust Infection: No new counties in 1948. Rust known on pine in 9 counties;
on ribes in 56 counties of the 99 counties in the State.

Survey Limitation: None performed in 1948. Ribes-free zones maintained around 7
of the 9 nurseries originally protected.

Canoe Pruning, 1948: 94 cankers removed from 58 trees; 11 infected trees cut
down. Cumulative: 1,709 cankers removed from 551 trees; 630 infected
trees cut down.

Surveying and Checking, 1948: No survey. 505 acres given regular check after
eradication.

Invited Black Currant Elimination, 1948: 4 plantings with 56 plants found;
14 plantings with 94 plants destroyed. Cumulative: 1,610 plantings
with 7,330 plants found; 1,601 plantings with 7,298 plants destroyed.

Summary of White Pine Blister Rust Control - December 31, 1948

MICHIGAN

White Pine Being Protected: Natural: 318,194 acres; Planted: 77,044 acres.
Total: 395,238 acres. Estimated value: \$33,000,000.

Status of Control (Net Acres)						
Item	National		Non-		Total	Percent of Total
	Forest Service	Park Service	Federal Public	Private		
W.P. in Control Area	58,670	15	128,712	207,841	395,238	-
Total Control Area	156,288	120	309,831	716,869	1,183,108	100.0
Worked Initially	153,813	120	291,126	620,126	1,065,185	90.0
Worked Twice	61,310	-	111,040	246,082	418,432	35.4
Worked More than Twice	18,136	-	21,309	45,561	85,006	7.2
On Maintenance	106,736	-	128,675	192,901	428,312	36.2
Needing Initial Work	2,475	-	18,705	96,743	117,923	10.0
Needing Re-Work	47,077	120	162,451	427,225	636,873	53.8

Local Control, All Agencies (Gross Acres)						
	Acres			Man-	Per	Acres
	White Pine	Acres	Ribes	Days		Man
Working	Protected	Worked	Destroyed	Used	Ribes	Day
Calendar Year 1948						
Initial	3,083	8,558	94,235	841	11.0	0.10
Second	4,049	9,728	81,648	713	8.1	0.07
Third and Other	4,807	10,949	55,202	1,053	5.0	0.10
Total, 1948	11,939	29,235	231,085	2,607	7.9	0.07
Cumulative 1928 to 1948 (Gross Acres)						
Initial	434,004	1,315,415	65,342,681	279,773	49.7	0.22
Second	154,282	418,432	8,166,081	54,643	19.5	0.11
Third and Other	32,742	85,006	1,085,630	10,287	12.8	0.12
Total, Cumulative	621,028	1,818,853	74,594,392	344,703	41.0	0.15

Blister Rust Infection: No new counties in 1948. Known on pines in 51 counties on ribes in all of the 83 counties in the State. Severe in Upper Michigan.

Nursery Sanitation: None performed in 1948. Ribes-free zones maintained around 7 of the 13 nurseries originally protected.

Canker Pruning, 1948: 470 cankers removed from 120 trees. Cumulative: 101,930 cankers removed from 41,596 trees; 291 infected trees cut down.

Surveying and Checking, 1948: 2,610 acres control area initially surveyed, 13,220 acres re-surveyed, and 3,262 acres retained; 91,562 acres post-checked and 69,716 acres retained; 29,235 acres given regular check after ribes eradication.

Cultivated Black Currant Elimination, 1948: 1 planting with 4 plants found and destroyed. Cumulative: 14,928 plantings with 147,843 plants found; 14,861 plantings with 147,189 plants destroyed.

Control Area Permits, 1948: 239 applications received; 190 approved; 7 rejected; and 42 voluntarily cancelled.

Summary of White Pine Blister Rust Control - December 31, 1948

MINNESOTA

White Pine Being Protected: Natural: 245,539 acres; Planted: 13,777 acres;
Total: 259,316 acres. Estimated value: \$25,000,000.

Status of Control (Net Acres)

I t e m	Forest Service	Indian Service	None		Total	Percent of Total
			Federal Public	Private		
W.P. in Control Area	98,227	21,690	54,199	85,200	259,316	-
Total Control Area	161,414	32,725	114,003	271,426	579,568	100.0
Worked Initially	60,657	32,682	75,449	205,813	374,601	64.6
Worked Twice	26,179	25,107	21,412	45,916	118,614	20.5
Worked More than Twice	11,003	16,196	5,378	1,539	34,116	5.9
On Maintenance	17,605	17,557	24,383	36,201	95,746	16.5
Needing Initial Work	100,757	43	38,554	65,613	204,967	35.4
Needing Re-Work	43,052	15,125	51,066	169,612	278,855	48.1

Local Control, All Agencies (Gross Acres)

Working	Acres		Acres Worked	Ribes Destroyed	Man- Days Used	Per Acre	
	White Pine Protected	Ribes				Ribes	Man- Days
Calendar Year 1948							
Initial	2,356	3,532	185,422	2,091	62.5	0.59	
Second	2,376	4,413	306,914	2,226	69.5	0.50	
Third and Other	4,218	6,388	1,047,884	4,895	164.0	0.77	
Total, 1948	8,950	14,333	1,540,220	9,212	107.5	0.64	
Cumulative 1917 to 1948 (Gross Acres)							
Initial	174,727	421,483	51,815,115	165,479	146.7	0.39	
Second	61,282	118,614	7,913,008	42,406	66.7	0.36	
Third and Other	22,536	34,116	2,360,771	15,342	69.2	0.45	
Total, Cumulative	258,545	574,213	72,088,894	223,227	125.5	0.39	

Blister Rust Infection: Pine infection found initially in 1948 in Dakota County, in a shelterbelt. Rust known on pines in 36 counties; and on ribes in 38 of the 87 counties in the State. Rust prevalent in all pine growing counties, and severe in northeastern Minnesota.

Nursery Sanitation: None performed in 1948. Ribes-free zones maintained around 6 of the 17 nurseries originally protected.

Canker Pruning, 1948: 17,635 cankers removed from 11,521 trees; 890 infected trees cut down. Cumulative: 67,936 cankers removed from 37,200 trees; 2,274 infected trees cut down.

Surveying and Checking, 1948: 3,259 acres control area initially surveyed; 22,396 acres re-surveyed, and 8,987 acres retained; 13,104 acres post-checked, and 12,441 acres retained; 9,184 acres given regular check after ribes eradication.

Cultivated Black Currant Elimination: None, 1948. Cumulative: 3,261 plantings with 23,309 plants found and destroyed.

Control Area Permits, 1948: 157 applications received; 136 approved; 1 rejected; 20 voluntarily cancelled.

Summary of White Pine Blister Rust Control - December 31, 1948

OHIO

White Pine Being Protected: Natural: 3,084 acres; Planted: 17,336 acres;
Total: 20,420 acres. Estimated value: \$6,000,000.

Status of Control (Net Acres)

I t e m	Forest Service	Non-		Total	Percent of Total
		Federal Public	Private		
White Pine in Control Area	520	6,663	13,237	20,420	-
Total Control Area	4,341	55,719	406,754	466,814	100.0
Worked Initially	4,029	40,139	138,864	183,032	39.2
Worked Twice	-	19,290	28,071	47,361	10.1
Worked More Than Twice	-	3,762	10,594	14,356	3.1
On Maintenance	4,029	13,554	62,448	80,031	17.1
Needing Initial Work	312	15,580	267,890	283,782	60.8
Needing Re-Work	-	26,585	76,416	103,001	22.1

Local Control, All Agencies (Gross Acres)

Local Control, All Agencies (Gross Acres)						
Working	Acres		Acres Worked	Ribes Destroyed	Man- Days Used	Per Acre
	White Pine Protected					Ribes Days
Calendar Year 1948						
Initial	290	1,946	5,881	84	3.0	0.04
Second	527	4,050	2,835	94	0.7	0.02
Third and Other	33	233	108	3	0.5	0.03
Total, 1948	850	6,229	8,824	181	4.2	0.09
Cumulative 1933 to 1948 (Gross Acres)						
Initial	15,775	206,280	2,547,335	32,908	12.3	0.16
Second	5,147	47,361	722,524	12,405	15.3	0.26
Third and Other	2,994	14,356	170,038	2,416	11.8	0.17
Total, Cumulative	23,916	267,997	3,439,897	47,729	12.8	0.19

Blister Rust Infection: No new counties in 1948. Rust known on pines in 10 counties; on ribes in 65 counties of the 88 counties in the State.

Nursery Sanitation: 1 Nursery worked initially in 1948. Ribes-free zones maintained around 5 of the 14 nurseries originally protected.

Canker Pruning: None in 1948. Cumulative: 126 cankers removed from 44 trees; 3 infected trees cut down.

Surveying and Checking, 1948: 359 acres of control area initially surveyed, 2,508 acres re-surveyed and 2,554 retained; 7,057 acres post-checked, and 4,374 acres retained; 5,290 acres given regular check after ribes eradication.

Cultivated Black Currant Elimination: None in 1948. Cumulative: 8,838 plantings with 75,605 plants found; 8,406 plantings with 73,117 plants destroyed.

Control Area Permits, 1948: 41 applications received; 26 approved; 5 rejected; 10 voluntarily cancelled.

Summary of White Pine Blister Rust Control, December 31, 1948

WISCONSIN

White Pine Being Protected: Natural: 403,638 acres; Planted: 36,271 acres;
Total: 439,909 acres; Estimated value: \$40,000,000.

Status of Control (Net Acres)

I t e m	Forest Service	Indian Service	Non-		Total	Percent of Total
			Public	Private		
Net In Control Area	32,733	50,561	96,134	260,481	439,909	-
Total Control Area	65,544	91,828	270,333	1,028,014	1,455,719	100.0
Marked Initially	57,603	81,166	267,967	769,664	1,176,400	80.8
Marked Twice	47,093	36,292	85,368	229,919	398,672	27.4
Marked More than Twice	4,144	10,028	6,455	15,934	36,561	2.5
in Maintenance	22,406	40,409	131,105	291,868	485,788	33.4
Requiring Initial Work	7,941	10,662	2,366	258,350	279,319	19.2
Requiring Re-Work	35,197	40,757	136,862	477,796	690,612	47.4

Local Control, All Agencies (Gross Acres)

Working	Acres		Acres Worked	Ribes Destroyed	Man- Days Used	Per Acre	
	White Pine Protected					Ribes	Man- Days
Calendar Year 1948							
Initial	21,010	61,956	338,746	3,012	5.2	0.05	
Re-work	7,131	14,390	420,389	3,693	29.2	0.26	
Other and Other	3,347	6,160	258,599	2,559	42.0	0.42	
Total, 1948	31,488	82,506	1,017,734	9,264	11.9	0.11	
Cumulative 1920 to 1948 (Gross Acres)							
Initial	399,464	1,294,654	87,352,279	365,446	67.5	0.28	
Re-work	148,038	398,672	9,161,058	75,166	23.0	0.19	
Other and Other	16,521	36,561	1,151,313	10,411	31.5	0.28	
Total, Cumulative	564,023	1,729,887	97,664,650	451,023	56.5	0.26	

Blister Rust Infection: Pine infection found initially in 1948 in Rock County.
Rust known on pine in 63 counties; and on ribes in all 71 counties in the State.

Nursery Sanitation: Sanitation work done around 3 nurseries in 1948. Ribes-free conditions maintained around 10 of the 17 nurseries originally protected.

Surveying and Checking, 1948: 51,881 acres of control area initially surveyed; 35,274 acres re-surveyed, and 23,860 acres retained; 26,011 acres post-checked, and 20,239 acres retained; 49,665 given regular check after ribes eradication.

Cultivated Black Currant Elimination: None in 1948. Cumulative: 6,601 plantings with 37,080 plants found; 6,597 plantings with 37,051 plants destroyed.

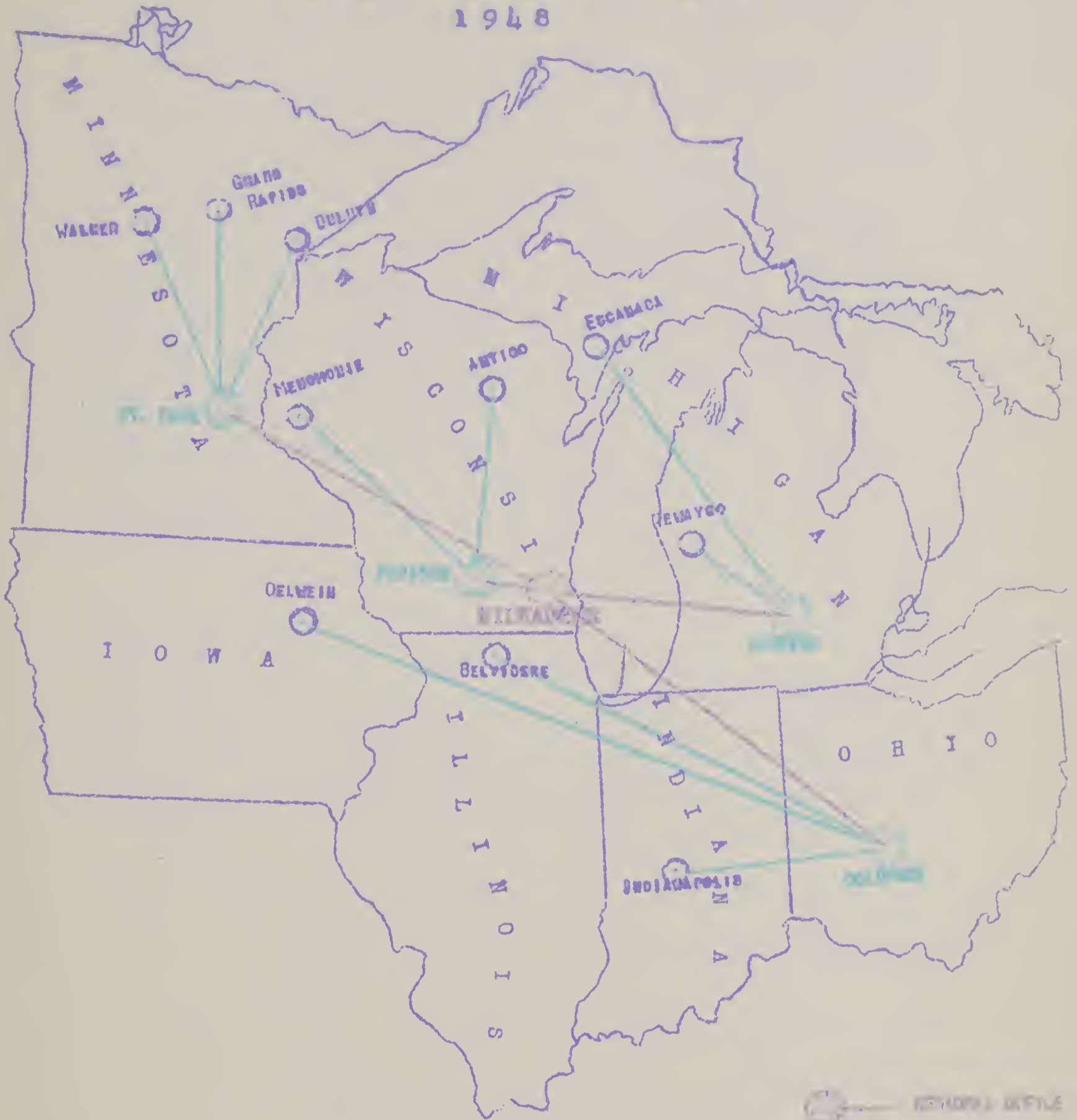
Control Area Permits, 1948: 348 applications received; 332 approved; 14 rejected; 2 voluntarily cancelled.

CHART I

LOCATION OF BLISTER RUST CONTROL OFFICES

NORTH CENTRAL REGION

1948



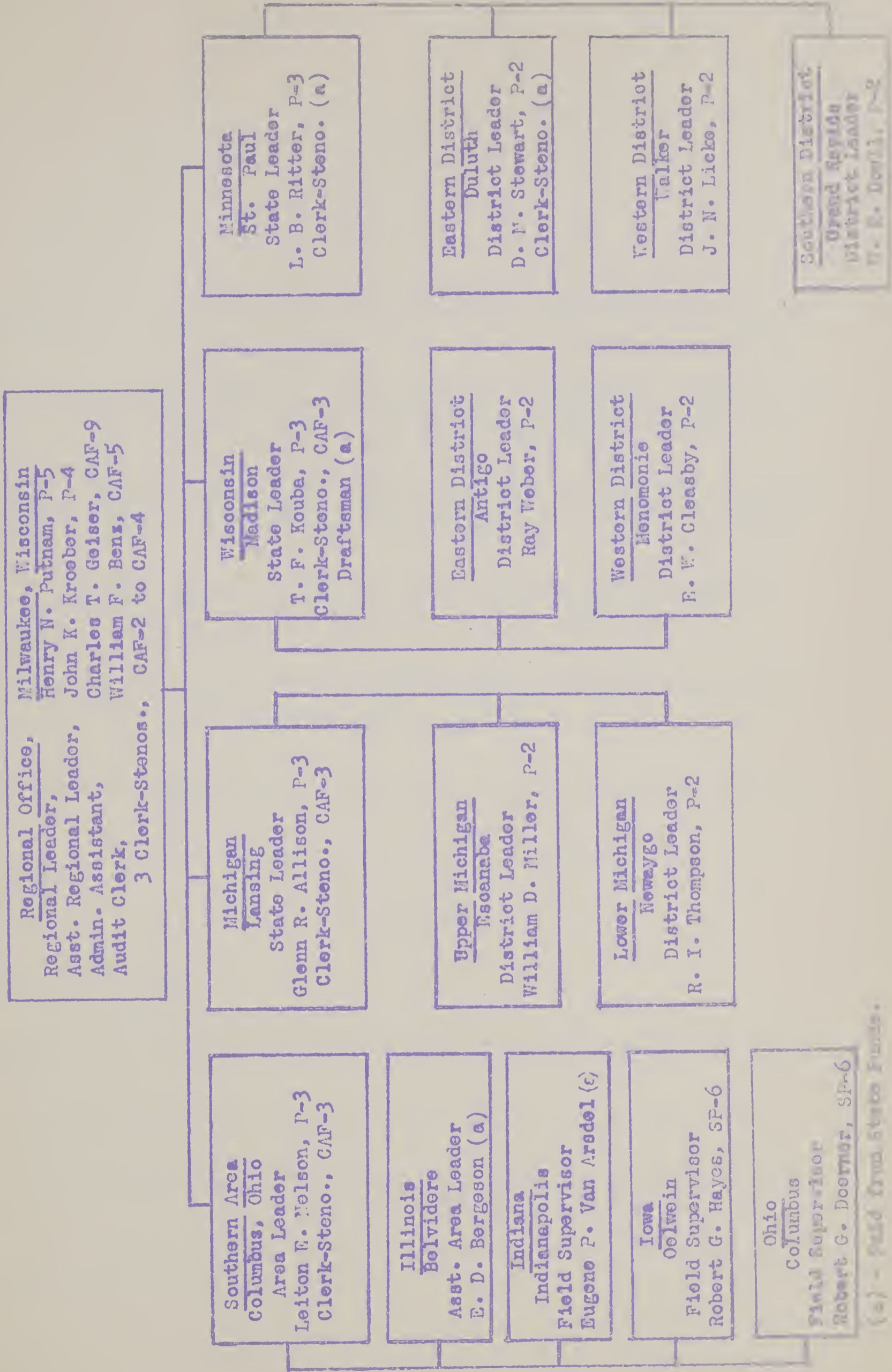
REGIONAL OFFICE

STATE OR DISTRICT OFFICE

DISTRICT OFFICE

C H A R T 2

ORGANIZATION CHART, NORTH CENTRAL REGION, AS OF DECEMBER 31, 1948



(a) - Field Area State Funds.

Detailed Narrative Report, 1948

Foreword

As initiated in 1942, the organization of the 1948 Report follows the same pattern. It is divided into four main parts, so arranged that separate will be available covering control work on National Forests and Indian Reservations to these respective agencies. The four divisions are listed below:

(1) BLR-1-3. Leadership, Coordination and Technical Direction. This includes summaries, general narrative section, and tables covering all activities. Local control work is included for completeness.

(2) BLR-3-3. Cooperative Blister Rust Control on State and Privately Owned Lands. This includes tables and a discussion by States of work done and status of control on lands in non-federal public and private ownership.

(3) BLR-4. Blister Rust Control Operations on National Forests. This includes tables and discussions of work done and status of control on each of the 11 white pine growing National Forests in this Region.

(4) BLR-7. Blister Rust Control Operations on Indian Reservations. This includes tables and discussions of work done and status of control on each of the 10 Indian Reservations producing white pine in this Region.

BLR-1-3. Leadership, Coordination and Technical Direction of White Pine Blister Rust Control, North Central Region

Organization

Permanent Organization

The permanent organization as of December 31, 1947, is shown in the accompanying chart. Several changes in the organization took place during the Calendar Year 1948. Details of these changes are as follows:

Mr. William F. Benz, was reclassified from Clerk CAF-4 to Clerk CAF-5, effective January 25, 1948.

Mrs. Katherine A. Dunham was appointed effective September 7, 1948, to fill a CAF-2 Clerk-Typist vacancy with headquarters at Milwaukee, Wisconsin.

Mrs. Lorraine Z. Heise, Clerk-Stenographer, went on maternity leave without pay effective January 11, 1949.

Mr. Donald F. Williams was transferred at a promotion effective May 24, 1948, from SP-6 Agent Field Supervisor, with headquarters at Duluth, Minnesota, to P-2 Agent Operation Supervisor with headquarters at Clarkia, Idaho.

Mr. Eugene P. Van Arsdal employed on state funds, was appointed as Collaborator unallocated without compensation effective October 12, 1948, with headquarters at Lafayette, Indiana, to head up the Blister Rust Control work in Indiana.

Mr. Robert G. Hayes was promoted effective June 27, 1948, from Agent SP-5 to Agent SP-6.

Mr. Robert I. Thompson, P-2, District Leader in Lower Michigan, and Donald F. Williams, SP-6 in Minnesota, were loaned to the Forest Service on 1080 procedure for one pay period on Lower Michigan National Forest and seven pay periods on the Superior National Forest, respectively. Thompson's employment by the Forest Service was in the winter, while that of Mr. Williams started in late winter and extended into the spring of 1948.

Labor Conditions

Labor for eradication crews in 1948 was largely obtained from the vicinity of each job and transported to work either by privately owned automobiles operated at no expense to the government, or, in some cases, by government cars. Labor was generally more available than in recent years. It was possible to be selective, and to employ a high proportion of experienced workers. Young men were again employed, particularly in Forest Service camps on the Superior National Forest, Minnesota. The proportion of college students to high school students was much higher in 1948 than in previous years. Indian women continued to be used as labor on Indian reservations, altho the proportion of them to men was lower in 1948.

Wage rates were again raised \$0.10 per hour in the spring to \$0.85 for labor, \$1.00 for crew leader, and \$1.15 for foreman. A new rate of \$0.95 for checker was added.

Man-Months Employment

There were employed in 1948 approximately 1581 man-months (Table 13), compared with 1861 in 1947 and 2612 in 1946. In comparison with 1947 there were increases in 1948 in man-months employed on state and private funds from 173 to 225; on the Forest Service program from 326 to 429; and on the Indian Service program from 479 to 515. However there was a reduction on Bureau 3101 from 274 to 257; and a sharp reduction in 3103 from 609 to 154 man-months. The drastic reduction in Bureau funds in Fiscal Years 1948 and 1949 was responsible. For the period January to June 1947 we were operating on the larger program existing in F. Y. 1947, during which 466 of the 609 man-months were employed.

Automotive Equipment

Five new passenger cars, replacing five worn-out ones were requisitioned in 1948 but were not delivered. Two Chevrolet Panel trucks, one a 1-ton, 1941 model, and the other a 1/2-ton 1939 model were transferred to us from the Barberry Eradication project. Seven passenger cars and four trucks were disposed of during 1948. At the end of 1948 we had nine passenger cars and 45 trucks, shown by year of manufacture as follows:

1937	1 passenger car	4 trucks
1939	0 passenger cars	16 trucks
1940	1 passenger car	3 trucks
1941	2 passenger cars	1 truck
1947	5 passenger cars	21 trucks
Total	9 passenger cars	45 trucks

Automobiles on Hand, January 1, Each Year

Type	1942	1943	1944	1945	1946	1947	1948	1949
Passenger Cars	21	18	13	12	13	12	16	9*
Trucks	56	44	37	36	34	34	47	45
Total	77	62	50	48	47	46	63	54

* Five new cars will be delivered in F.Y. 1949

Government Autos in Use, 1948, North Central Region

Make	Model	Year	On Hand Jan. 1, 1948	Received During 1948	Sold or Declared Surplus 1948	On Hand Jan. 1, 1949
<u>Passenger Cars</u>						
Ford 60	Tudor	1937	2	0	2	0
Ford 85	Tudor	1939	1	0	1	0
Chevrolet	Standard Coach	1935	1	0	1	0
Chevrolet	Standard Coach	1939	1	0	1	0
Chevrolet	Standard Coach	1940	2	0	1	1
Chevrolet	Sedan, 4-Door	1940	1	0	1	0
Studebaker	Champion Coach	1941	2	0	0	2
Pontiac 6	Sedan, 4-Door	1937	1	0	0	1
Pontiac	Sedan, 4-Door	1947	4	0	0	4
Plymouth	Sedan, 4-Door	1947	1	0	0	1
Total Passenger Cars			16	0	7	9
<u>Trucks</u>						
Ford	Pick-up	1937	3	0	1	2
Ford	1-1/2 Ton Stake	1947	3	0	0	3
Ford	Sedan Delivery	1940	1	0	0	1
Chevrolet	Sedan Delivery	1947	18	0	0	18
Chevrolet	Sedan Delivery	1937	2	0	0	2
Chevrolet	Sedan Delivery	1939	1	1	0	2
Chevrolet	Pick-up	1940	1	0	0	1
Chevrolet	Sedan Delivery	1940	1	0	0	1
Chevrolet	1-Ton Panel	1941	0	1	0	1
Plymouth	Pick-up	1939	15	0	2	13
Dodge	Pick-up	1935	1	0	1	0
Dodge	1-1/2 Ton	1939	1	0	0	1
Total Trucks			47	2	4	45
Total Automobiles			63	2	11	54

Automobile Accidents

There were three automobile accidents involving government-owned vehicles in 1948, two minor and one serious in which a State employee received chest injuries. In 1948, 310,897 miles were driven in 54 government-owned cars. Thus, there was one automobile accident per 103,632 miles of travel. Details of the two minor and one serious automobile accidents follow:

1. Chevrolet Sedan Delivery, 1947 - License A-5153
Driver - William R. Doell
Passengers - None
Place - Grand Rapids, Minnesota
Date of Accident - September 22, 1948
Cause - Freight truck backed into car.
Damage to Government Car - Right front hood crushed and hood thrown out of line.
Repairs - \$14.75, paid by insurance company.
Damage to other car - None
Injuries - None
2. Chevrolet Sedan Delivery, 1947 - License A-5167
Driver - Eugene P. Van Arsdal
Passengers - None
Place - Wabash, Indiana
Date of Accident - October 14-15, 1948
Cause - Unknown, car legally parked at curb, was struck and slightly damaged by another vehicle which was not identified.
Damage to Government car - Left front fender slightly dented.
Repairs - \$4.40, Government expense.
3. Chevrolet Sedan Delivery - 1947 - License A-5229
Driver - David P. Wadsworth
Passengers - None
Place - Saginaw, Michigan
Date of Accident - October 25, 1948
Cause - Driver of approaching car turned out to pass truck, and hit oncoming government car.
Damage to Government Car - Entire front end damaged including fenders, hood, lights, bumper, and steering mechanism.
Repairs - \$350.00, paid by insurance company
Damage to Other Car - Front and right side damaged.
Repairs - \$450.00
Injuries - Sustained by David P. Wadsworth, chest bruised and congestion. Knee and head bruised. Driver of other car not injured.

Compensation Cases

During 1948 there were three compensation cases processed through the Milwaukee office, for persons employed on 3101 and 3103 funds. Two of these were poison ivy cases in Wisconsin, and the one in Minnesota was caused by a puncture of right forearm, in which seven days time was lost not covered by annual or sick leave.

The number of compensation cases processed through the Milwaukee office from 1936 to 1948 are shown in the following table by years and types of injury. These covered men employed on federal WPA programs, and on Bureau funds, both administrative and matching during the 13 years. The smallest number of cases, three, were reported in 1948, as well as the smallest amount of employment. The lowest rate occurred in 1937 with 2.81 cases per 1000 man-months. This year was the first for several

years in which weather conditions were cool and moist during the summer months. The highest rate was in 1945, increased chiefly by a serious automobile accident injuring eight men in northeastern Minnesota. A 1-1/2 - ton truck carrying eradication workers was hit and overturned by a Grayhound bus.

As would be expected in woods work, cuts, sprains and bruises, ivy poisoning, and eye injuries accounted for more than 84 percent of the 350 cases. Ivy poisoning cases varied considerably by years. For the period 1938 to 1941 these cases were most common in relation to other types. Several factors were responsible for this variation including geographical distribution of work, individual susceptibility of workers, weather conditions, use of Ivy-Tox, etc.

We have always stressed the importance of reporting even minor injuries. In the great majority of cases reported injuries were minor, and little, if any, lost time resulted. No fatal injuries occurred, and very few men had to be hospitalized.

As a preventive measure, all camps, crews, automobiles are equipped with first aid kits, and most of the supervisors have been given training in first aid.

Compensation Cases Processed Through the Milwaukee Office,
North Central Region, 1936 to 1948

Calendar Year	Heat and Frost Injury	Dog Bites	Insect Caused Injury	Eye Injury	Ivy and Other Plant Poisoning	Infection	Cuts Sprains Fractures Bruises	Total	Number of Man Months	Cases per 1000 Man-Months
1936	3	-	4	22	16a	8	34	87	12,033	7.23
1937	-	-	-	5	2	2	4	13	4,583	2.84
1938	-	-	-	13	19	7	15	54	4,977	10.85
1939	1	3	3	8	26	1	7	49	4,458	10.75
1940	-	1	2	5	13	2	11	34	3,469	9.80
1941	-	1	1	7	12	3	8	32	3,516	9.10
1942	-	-	-	-	1	3	1	5	442	11.29
1943	-	-	-	1	2	-	1	4	440	9.09
1944	-	-	-	1	-	1	3	5	461	10.85
1945	-	-	-	3	2	3	13b	21b	764	27.49
1946	-	-	-	5	8	5	14	32	1,579	20.27
1947	-	-	-	2	2	1	6	11	883	12.46
1948	-	-	-	-	2	-	1	3	411	7.30
Total	4	5	10	72	105	36	118	350	38,016	9.21
Percent	1.1	1.4	2.9	20.6	30.0	10.3	33.7	100.0		

a - Includes 2 organic disease cases.

b - Eight of these due to one serious automobile accident in Minnesota

Construction and Equipment

In October 1948 improvements were made in office facilities at our District headquarters in Grand Rapids, Minnesota. Here-to-fore we had used as an office a small space partitioned off in one of the old CCC headquarters buildings used as a warehouse to store our equipment. No toilet facilities were available. Heating of the small office space with a small oil heater was difficult, unsatisfactory and dangerous.

An additional three room building was assigned to us by the Forest Service. This contained a toilet, running water was provided, and space was ample for office use. To make the building habitable it was necessary to reinforce the floor supports, fix the plumbing, and install a suitable space oil heater. This was done at a cost of \$171.08, and Mr. Doell moved into his new quarters the latter part of October with much satisfaction.

There was purchased one VictorTriumph 16 mm sound projector, stand, splicer, and speaker for \$351.82. A tripod screen, 37" by 50" was also bought for \$27.93.

By transfer from surplus lists of other agencies we obtained, without cost, such items as a camera, postal scale, bookcase sections, typewriters, desks, chairs, transfer cases, etc. Most of this equipment was for use in our field offices.

Authorization and Sources of Funds

As in the past several years, the work in 1948 was continued under Memoranda of Agreement drawn up between the responsible State Agencies and the Bureau of Entomology and Plant Quarantine. These, with the exception of the new agreement with Iowa, which is shown in the 1945 Regional Report, are shown in the 1936 Regional Annual Report, and are not repeated here.

During 1948, work was performed on funds furnished from the following sources:

1. State and Private

- a. Direct aid (Ribes eradication matched by 3103 and 73.14 Federal)
- b. Indirect aid (Other services)

2. Federal Blister Rust Appropriation

- a. 3101 and 71.14 Leadership, coordination, and technical direction
- b. 3103 and 73.14 Cooperative blister rust control on State and private lands. (Matched by State direct aid)

- c. 3104 and 74 Blister rust control on National Forests in Michigan, Minnesota, and Wisconsin
- d. 3107 and 77 Blister rust control on Indian Reservations in Minnesota and Wisconsin (Matched by Tribal funds on the Menominee Indian Reservation)

Spread of the Rust

Prolonged periods of drought and high temperatures during the summer and early fall resulted in smaller amounts of infection on ribes in 1948 than in any of the previous 10 years. Conditions were generally unfavorable for pine infection.

Rust on ribes was not reported initially from any county in the Region in 1948. Pine infection was found initially in two counties: Rock County, Wisconsin, and in a shelterbelt in Dakota County, Minnesota.

In the Southern Area ribes infection was generally light. Additional cankers were found at two previously known pine infection centers in Indiana. Pine infection was discovered in four, and ribes infection in nine of the 10 areas worked in 1948 in Iowa.

In the three Lake States ribes infection was generally abundant in the northern parts, where the proximity of fruiting cankers yearly causes heavy ribes infection despite adverse weather conditions. Additional pine infection centers and intensification of the rust on pines in unprotected areas were reported in 1948.

Known spread of the rust on pines and ribes by states at the end of 1948 is given statistically in the following table, and graphically in Chart No. 3. In general ribes infection has been found in all of the important pine producing counties, and pine infection in most of them.

Counties in Which White Pine or Ribes Infection Has Been Found to December 31, 1948 - North Central Region

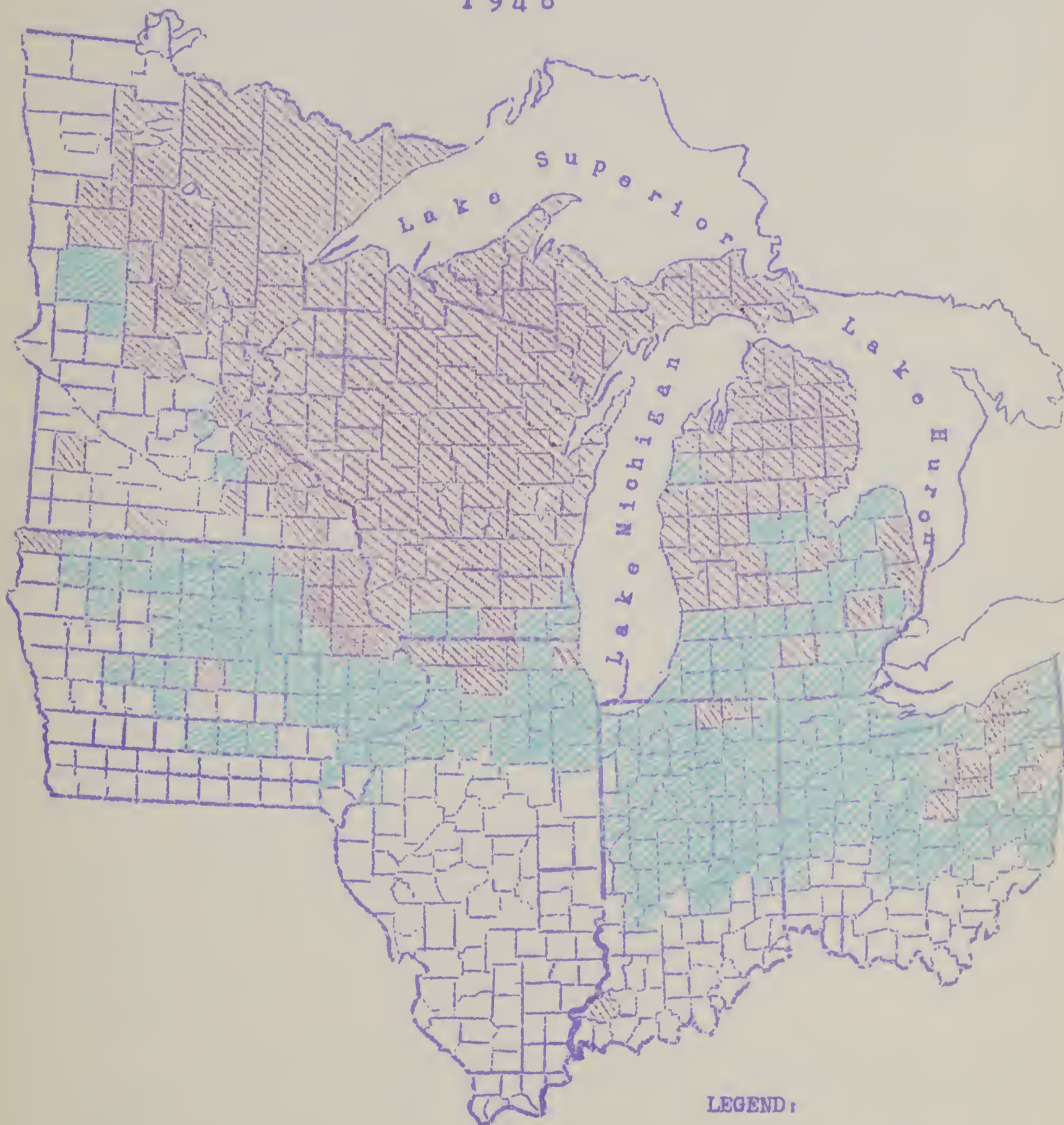
State	Total Number of Counties	Number of Counties with Infection				Percent Counties with Rust	
		Found		Cumulative			
		Initially 1948		to 12/31/48		On Pines	On Ribes
		on Pines	On Ribes	On Pines	On Ribes	On Pines	On Ribes
Illinois	102	-	-	6	24	6%	24%
Indiana	92	-	-	3	53	3	58
Iowa	99	-	-	9	56	9	56
Ohio	88	-	-	10	65	11	74
Michigan	83	-	-	51	83	61	100
Minnesota	87	1	-	36	38	41	44
Wisconsin	71	1	-	63	71	89	100
Region	622	2	-	178	390	29	63

CHART 3



STATUS OF BLISTER RUST INFECTION

NORTH CENTRAL REGION

1948



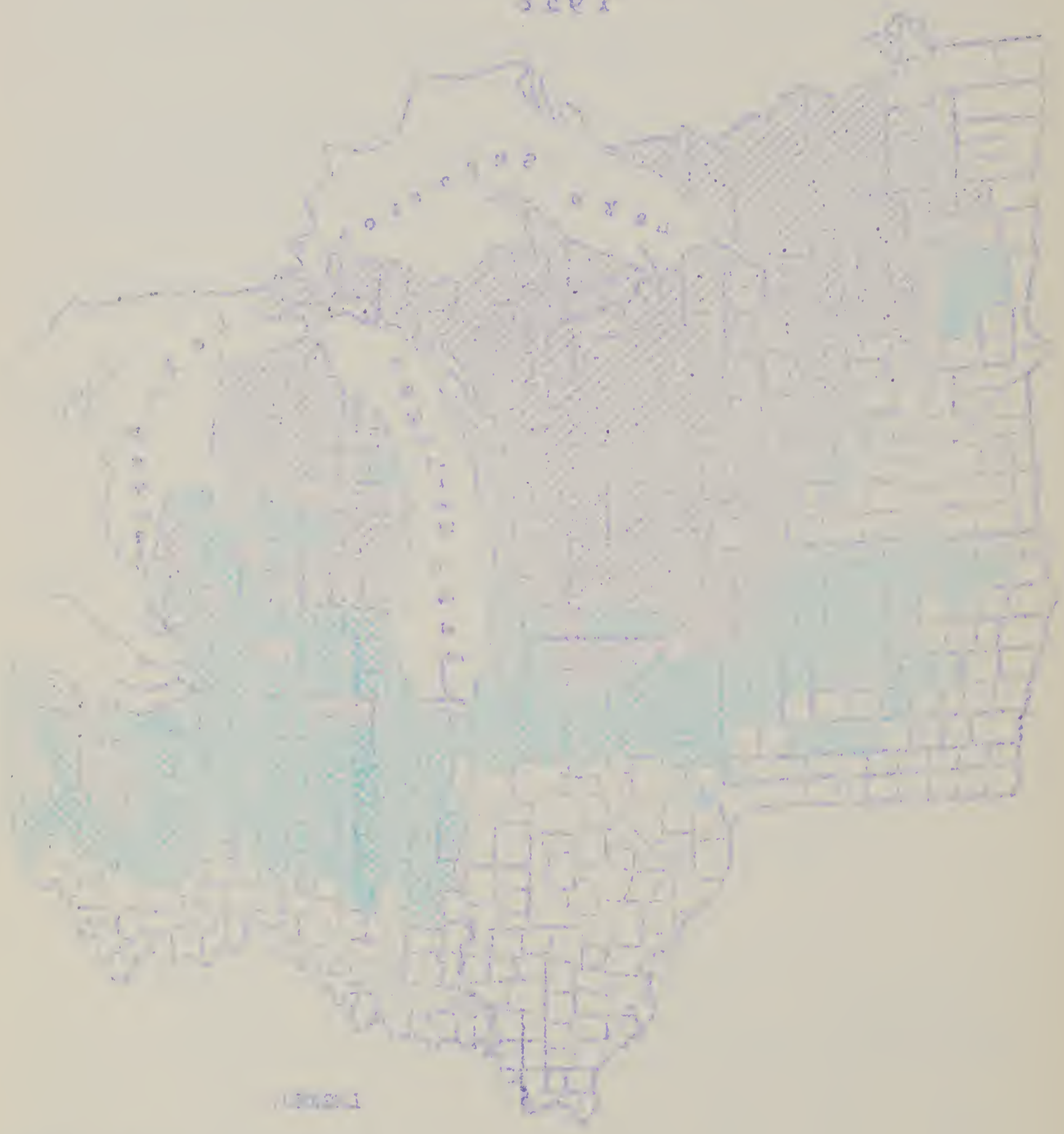
LEGEND:

-  Pine and Ribes Infection
-  Ribes Infection Only

STATE OF NEW YORK

IN SENATE

1913



Printed and sold by the
State Printer (1913)

The status of the rust at the end of 1948 in each of the states was as follows:

Illinois

No new locations of pine infection were reported in 1948, although 283,000 white pines at 135 locations in 23 counties were examined. No rust was found on 7,665 wild ribes and 32 cultivated black currants inspected at 137 locations in seven counties. Weather was too hot and dry for optimum spread in 1948. To date pine infection has been found in six counties on pines and in 24 counties on ribes, all in the northern part of the state.

Indiana

No new centers of infection were found in Indiana in 1948, either on pines or ribes. Additional cankers were found in two known infection centers in Elkhart and LaGrange counties. Rust on ribes was very light in 1948. It was found in small amounts in Wabash and Whitley counties.

To date infection has been in three counties, two of which are still active in extreme north of state, and one, in extreme southwest, found in 1911 on imported pines and destroyed. On ribes rust has been found in 53 counties in northern two-thirds of the state, mostly in 1947.

Iowa

No new counties were added to the list with infected pines or ribes in 1948. However, pine infection was found in shelterbelts initially in 1948 in Clayton and Delaware Counties, and in 1947 in Fayette County. In 1948 pine infection was found in four and ribes infection in nine, of the 10 areas worked for ribes.

To date rust on pines has been found in nine and on ribes in 56 of the 99 counties in the state.

Ohio

Neither pine nor ribes infection was found in new counties in Ohio this year. Infection on ribes in counties where it had been found before was found to be generally light because of the dryness of the summer. To date, rust on ribes has been found in 65 of the 88 counties in the State.

Michigan

No new counties were added to the list of those having pine infection. However a continuing increase in the number of cankers in unprotected stands in counties known to have pine infection was observed. Ribes infection has previously been found in all counties. Due to the dryness of the season it was not as intense in 1948 as in some other years. To date rust on white pine has been found in 52 counties.

Minnesota

No ribes or pine infection was reported in 1948 from new counties, because it is now thoroughly established in the white pine belt, and no accounting was done outside of this area. It seems probable that rust on

ribes could be found in practically every county, if a search were made. Pine infection in 1948 continued to intensify in unprotected stands in the northeastern part of the State. Surveys made this year, disclosed so much destruction of young pines from blister rust that several hundred acres of young pine were removed from the control problem because of the loss of pine values.

To date, rust on pines has been reported from 35 counties and on ribes from 38 counties.

Wisconsin

Pine infection was found for the first time in Rock County bringing the total number of counties in which the disease has been found in Wisconsin to 64.

White Pine

Values

In the 1942 Report a discussion was given of the intrinsic, aesthetic and protection values of white pine, and its value as a basis of employment. The commercial value alone was estimated at about \$104,000,000. In present day terms with ceiling prices lifted in 1946, it is probable that the commercial value can be set at \$150,000,000. Stumpage prices of \$30 and \$40 per thousand board feet have been common in Minnesota in recent years.

Surveys

Table 1 indicates the large amount of survey work that was done in 1948. A total of 79,021 acres of white pine was mapped involving 206,547 acres of control area. The net result of these surveys was a gain of 5,266 acres of pine and a reduction of 7,389 acres of control area over that which had been previously mapped. The increase in pine acreage is due largely to additional young white pine coming in during the recent ten year wet cycle. The decrease in control area is due to reduction in protection zone widths in areas surveyed or worked several years ago.

Ownership of White Pine

Acreage figures on ownership of white pine in the control problem are constantly changing and can only be expressed in approximate terms. The status in 1948 is shown following:

Ownership	Natural	Planted	Total	Percent
Forest Service	140,063	50,105	190,168	16.8
Indian Service	71,109	1,187	72,296	6.4
National Park Service	15	-	15	Trace
Non-Federal Public	226,427	63,438	289,865	25.6
Private	534,112	45,031	579,143	51.2
Total	971,726	159,761	1,131,487	100.0
Percent	85.9	14.1	100.0	

Checking

This activity, while a type of survey, is treated separately. Checking is the systematic evaluation of ribes eradication the same year the work is done to determine if acceptable ribes eradication work has been performed, or if the whole or certain portions of a given area need rework. If the check reveals portions of an area with ribes feet of live stem averaging substantially more than 25 feet of live stem per acre, those portions should be reworked.

The results of checking of ribes eradication work in 1948 are shown by states and ownership classes in Table 4. It will be noted that of the 94,370 acres worked and checked 99.3 percent showed less than 25 F.L.S. per acre after eradication. The average for all checking was 2.3 bushes and 5.1 F.L.S. per acre.

Local Control Accomplishment

A more detailed discussion of local control accomplishments is given in the sections devoted to the separate ownership classes, state and private lands, work Project BLR-3; National Forests, Project BLR-4; and Indian Reservations, Project BLR-7. The discussions following will pertain to the work as a whole.

Local Control in 1948

In Table 2, 2A, and 3, local control work performed in 1948 is shown classified by states and work agencies. Considering both initial and rework there were 53,736 acres of white pine protected by removing 2,849,840 ribes from 137,634 acres of control area at a cost of 21,602 man-days. Approximately 58 percent of the acreage covered was initial; 25 percent was second working, and 17 percent was third and other workings.

Compared with 1947 there was less pine protected in 1948 by 13,575 acres or by about 20 percent. Most of this decline is reflected on state and private lands on which there were only about half as many man-days expended as in the previous year. Efforts to bolster the reduced federal funds for work on state and private lands by soliciting more State and private aid were partially successful but not sufficiently to offset the drastic reduction that was suffered by the Bureau-State Project after June 30, 1947. At this rate, the control program on state and private lands is losing ground and thousands of acres of good white pine will have to be abandoned to the rust.

The Indian Service and Forest Service Projects are pretty well on schedule and control work on all Reservations and Forests, except the Superior is being kept abreast of the need. The largest number of man-days used were on Indian Service funds (45 percent), the next largest Forest Service (32 percent) while man-days expended for work on state and private lands came in a poor third (23 percent).

Wisconsin led the states in the amount of damage cleared of ribes, followed by Michigan. The largest number of ribes was destroyed in Minnesota where the general abundance of ribes on the Indian Reservations and the Superior National Forest is well known.

Ribes eradication crews worked in Ohio and Indiana on state and private lands while the control work done in Indiana and Illinois was performed by the supervisory personnel in conjunction with survey activities.

Experiments in Local Control Procedure

Observations made on cut stems of ribes which were treated with a 20 percent solution of 2,4-D last year indicated that this method of destroying hard to pull ribes was not altogether successful. Considerable sprouting was observed. For the time being, therefore, the more effective method of treating broken crowns and roots of hard to pull ribes with a 50-50 mixture of salt and borax will be continued until it is proven that 2,4-D or some other chemical is better.

Follow-up inspections were made of the combination chemical spray-hand pulling method used in Evergreen Park, Sheboygan, Wisconsin last year. This method was discussed in last years annual report. The area contained several species of ribes including large number of R. americanum. Foliage spray of 2,4-D is effective only on R. americanum. A six man eradication crew was used. Three lead men uprooted all but the R. americanum bushes. Following the three men were two men with backpack sprayers, spraying R. americanum bushes. The foreman checked on both operations. It is calculated that the area was cleared of ribes at one-quarter the cost of hand pulling alone. Further, it was found that the treated R. americanum bushes produced no sprouts which is a decided advantage over hand pulling of this species which is notorious for its ability to sprout from broken crowns or other parts of the plant left in the ground. In the 1948 inspections it was found that because the area had been opened up by the destruction of the heavy concentrations of American black currants, new seedlings of this species appeared in large numbers. These seedlings were sprayed with 2,4-D and a complete kill was obtained. Experience gained on this area indicates the effectiveness of destroying R. americanum with 2,4-D sprays. Even with the second application in the following year, this treatment of large concentrations of R. americanum is more economical than the hand pulling method, and much more effective.

The tendency toward using smaller eradication crews has grown in recent years. While scarcity of labor and high wages were the initial motivating factors, experience has also shown that under certain conditions the small crew is more economical. Four-man crews, with three men in the line and a checker behind have proven to be very effective, and under some conditions, just three men working abreast, with the middle man acting as both crewman and crew leader, have been successful.

This year, for the first time in this Region, the one-man system of ribes eradication was given a trial. This method was patterned after that used in the West, in that one man is responsible for working assigned lanes, usually two to four chains wide. In general lanes in this Region were not pre-strung as they are in the West, and acre designations were

not marked. Instead, lane limits were marked by the worker, either before he began pulling ribes or as he progressed across the lane. In the latter case he marked extensions of his lane either by throwing a ball of twine along the boundary, or marking it with paper. Like the individual worker in the West, however, the one-man ribes puller in this Region worked back and forth across his lane, marking his strip limits either by a cord whose length was twice the width of his lane, or by two cords, each as long as his lane was wide.

A very important detail was the kind of draw cord used. The ideal cord is one sufficiently strong not to break, smooth enough to avoid snagging in brush, braided to avoid unraveling, and light enough to be easily pulled. After experimentation with window cords, chalk line, fish line, etc., it was found that 8-ply braided cord used in making Seine nets, was most practical.

The one-man system was tried out in Ohio, Michigan, Minnesota and Wisconsin. In the latter states comparative data were taken on work done by various size crews, as shown in the following table:

Summary of Crew Methods Used - Minnesota, Wisconsin, 1948

Crew Method	Acrea Worked	Average Number Ribes Pulled per Acre	Average Acres Worked per Man-days	Average Ribes Pulled per Man-days	Average F.L.S. per Acre Left After Working
1 - Man	315	41	2.3	92	7.3
3 - Man	238	27	3.1	82	3.5
4 - Man	167	46	3.0	138	13.0
6 - Man	138	26	1.9	51	5.3
Totals	858	35	2.5	89	7.0

The areas represented in the above table were uplands with ribes of medium abundance. Efforts were made to try out these different methods on similar types. Since there was an average of 41 ribes pulled per acre by the one-man system, the next to the highest ribes concentration, a satisfactory amount of work, 2.3 acres per man-day, was performed. Strangely enough, the four-man crew (3 men in line with 1 man back of the line) showed nearly the largest amount of work done, 3.0 acres per man-day although there was the largest amount of ribes per acre, 46. Since the addition of the fourth man back of the line should add to the efficiency of the crew, it is equally strange that the largest amount of ribes live stem per acre was left after working by the four-man crew.

The six-man crew showed the smallest volume of work per man-day. With the fewest ribes per acre, the smallest number of acres, 1.9, were worked and the fewest ribes, 51, were pulled per man-day.

After nearly one season's experience with the one-man system, reactions of our field men to the system vary. In general they agree that it has merit where ribes are medium in upland types, and where brush is not too dense. Advantages and disadvantages after a part of one season's experience may be summed up as follows:

Advantages:

1. Since one man is solely responsible for the work in his lane both as to quantity and quality, poor men are quickly exposed and can be dismissed.
2. No time is lost due to talking or horseplay.
3. There is a saving in string.
4. The method brings out and develops the quality of accepting individual responsibility.

Disadvantages:

1. Many men do not like to work alone.
2. Pulling cord through the brush all day is hard physical work.
3. Since the men are scattered, they can be less frequently supervised, and one supervisor can effectively handle fewer men. There is added responsibility on the crew leader to lay out his work and to supervise his men.
4. The temptation is present to give erroneous reports of numbers of ribes pulled.

It was the consensus of opinion by all who had anything to do with the new system that it has definite possibilities under certain conditions and should be given a further trial. Also, that new men started on this system are apt to take more kindly to it than are men who have been trained in the other crew methods and therefore hold preconceived ideas on how the work should be done. In this respect, the one-man system was not given a fair trial in 1948 because it was instituted late in the season, after the workers had already been trained in the more conventional ways of doing ribes eradication.

Status of Control

The present status of control by States and ownership classes is given in Tables 6 and 7 and graphically in Charts 1 and 2. As of December 31, 1948 the status of control by States including all ownerships is shown in the following table:

State	Control Area	Percent	
		Initially Worked	On Maintenance
Illinois	13,424	83.5	17.3
Indiana	188,382	40.6	27.9
Iowa	50,041	68.4	37.7
Ohio	466,814	39.2	17.1
Michigan	1,183,108	90.0	36.2
Minnesota	579,568	64.6	16.5
Wisconsin	1,455,719	80.8	33.4
Region total	3,937,126	74.2	29.6

It is apparent that there is still a great deal of work to be done before the white pine worth protecting is all on a maintenance basis. While 74 percent of the control area has been initially worked, only 29.6 percent is on a maintenance basis. Thus, not only is there need for performing initial eradication on approximately 26 percent of the areas, but approximately 60 percent of that already initially worked has to be examined and possibly reworked before it is on maintenance.

From the above table it appears that Michigan, with 90 percent of its control area initially worked and 36 percent on maintenance, is the farthest advanced of all the States toward the goal of having control accomplished around all worthwhile stands. While 28 percent of the control area in Indiana and 17 percent in Ohio are shown as being on maintenance it is probable that a much higher percent can be placed on maintenance in these States when it is possible to adequately examine white pine areas in the southern portions where ribes are relatively scarce or absent.

In the northern part of the three Lake States, especially in northeastern Minnesota, where on many sites white pine is the best possible crop to grow, the favorable seasons since 1937 have very markedly increased the germination and growth of white pine reproduction. This increase in the number of young white pine trees has not only extended the known limits of white pine areas but has also materially tended to increase the stocking of these trees in existing white pine stands.

Unfortunately, however, the conditions favorable to white pine reproduction have also been favorable to rust spread and development. The net result is that in unprotected stands the rust is killing young white pines at a greater rate than they are coming in through natural regeneration.

During the war years when funds for blister rust control and labor were scarce, our only sound approach to the problem has been to protect the very cream of the crop and to make our funds go as far as possible in saving the greatest number of white pine trees. In so doing, however, it is inevitable that millions of young white pines on tens of thousands of acres will be killed. It is hoped that funds and labor will be made available so that this destruction of young white pines can be greatly lessened if not halted, and that white pine sites may be permanently cleared of ribes, thus allowing future generations of white pines to grow undamaged in blister rust invaded areas.

As blister rust control workers we must look farther than saving the existing white pine crop. We must remember that the presence of ribes on a good white pine site destroys not only the existing stand but prevents indefinitely the production of future white pine forests. Thousands of acres in the northern part of the three Lake States would be best utilized if they were in white pine production. Therefore, as funds and labor permit, the protection of such white pine sites must be taken into consideration in blister rust control plans.

Cumulative Local Control

In Table 8, total eradication work by workings, States, and ownership classes are shown from the time work started to and including 1948. Acreages for initial working in Table 8 are gross and will differ from net initially worked acreages in Tables 6 and 7. In the latter tables, if an area after initial working was burned over and pine values destroyed, acres initially worked were removed from the status table. Such acres are retained, however, in Table 8, because it is a statement of work done.

It may be noted in Table 8 that 3,384,699 acres have been worked initially; 1,020,722 acres, or 30 percent worked twice; and 189,928 acres, or 5 percent worked more than twice.

In Table 8, ribes destroyed per acre are shown. Since this is a cumulative table with large acreage and ribes figures, the per acre figure should be fairly representative of ribes abundance in the State or ownership class concerned. In Chart 3, the average number ribes destroyed per acre in "All Workings" is used, in order to obtain as large a base as possible.

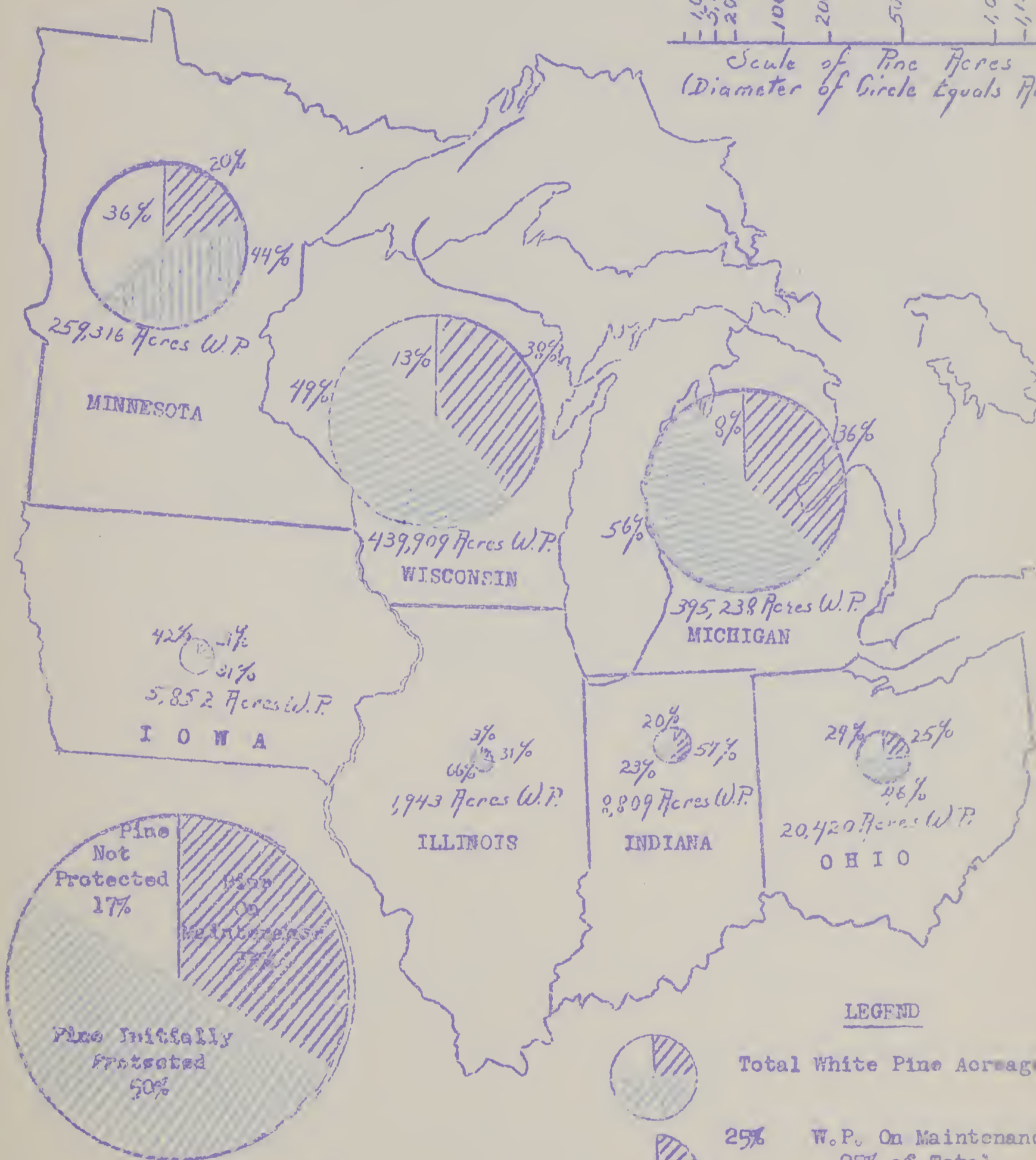
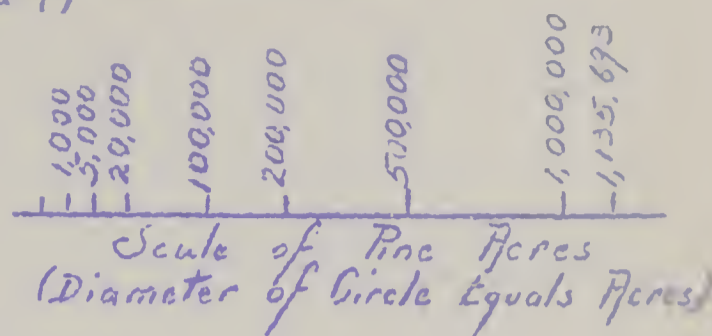
In order of increasing abundance of ribes, starting with the smallest number per acre, the States line up as: Indiana, Ohio, Michigan, Wisconsin, Illinois, Iowa, Minnesota. Iowa is second high primarily because much of the acreage in control zones around shelterbelts consisting only of cultivated fields, was not counted. This reduced the number of acres to apply against the number of ribes pulled. The average number of ribes per acre in Minnesota, 125.5 is over one-third again larger than its nearest competitor, Iowa, with 91.2 ribes per acre.

On the basis of ownership classes, ribes destroyed per acre were much more abundant on Indian Reservations, 188.1 per acre, than on National Forests, 50.4 per acre, or on private lands, 50.6 per acre, or on state lands, 45.6 per acre.

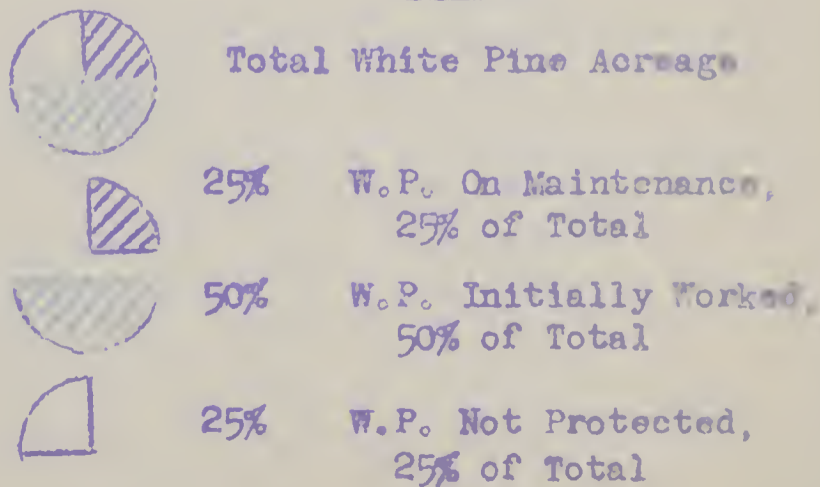
In Table 8A a summary of ribes eradication, all workings, from inception through 1948 is given by States, ownership classes, and operating agencies. The chief value of Table 8A is to show the operating agencies which have performed ribes eradication on lands under varying ownerships. Thus, on lands under Forest Service ownership, Bureau funds have been used to eradicate ribes from 128,583 of the total 485,174 acres worked. On the other hand Forest Service funds have been used to work 845 acres out of 2,735,475 acres of private lands worked. It is economically sound for land of all ownerships to be covered for ribes within the working radius of a crew of trained men. The working of Forest Service pine by Bureau crews, and of State and private white pine by Forest Service crews can thus be balanced off, one against the other.

CHART 4

STATUS OF BLISTER RUST CONTROL WORK, ALL OWNERSHIP,
IN NORTH CENTRAL REGION - 1948. ACRES OF WHITE PINE
(Based on Tables 6 and 7)



LEGEND



NORTH CENTRAL REGION
Total White Pine Area
1,131,485 Acres

CHART 5

Status of Control at End of Each Year as Shown, All Ownerships

NORTH CENTRAL REGION

Net Acres

Legend:

Control Area

Initially Worked,

Not on Maintenance

Control Area

Initially Worked,

On Maintenance

Responsible
Party Values

3,500,000

3,000,000

2,500,000

2,000,000

1,500,000

1,000,000

500,000

Area Worked

Control

Area

Acres

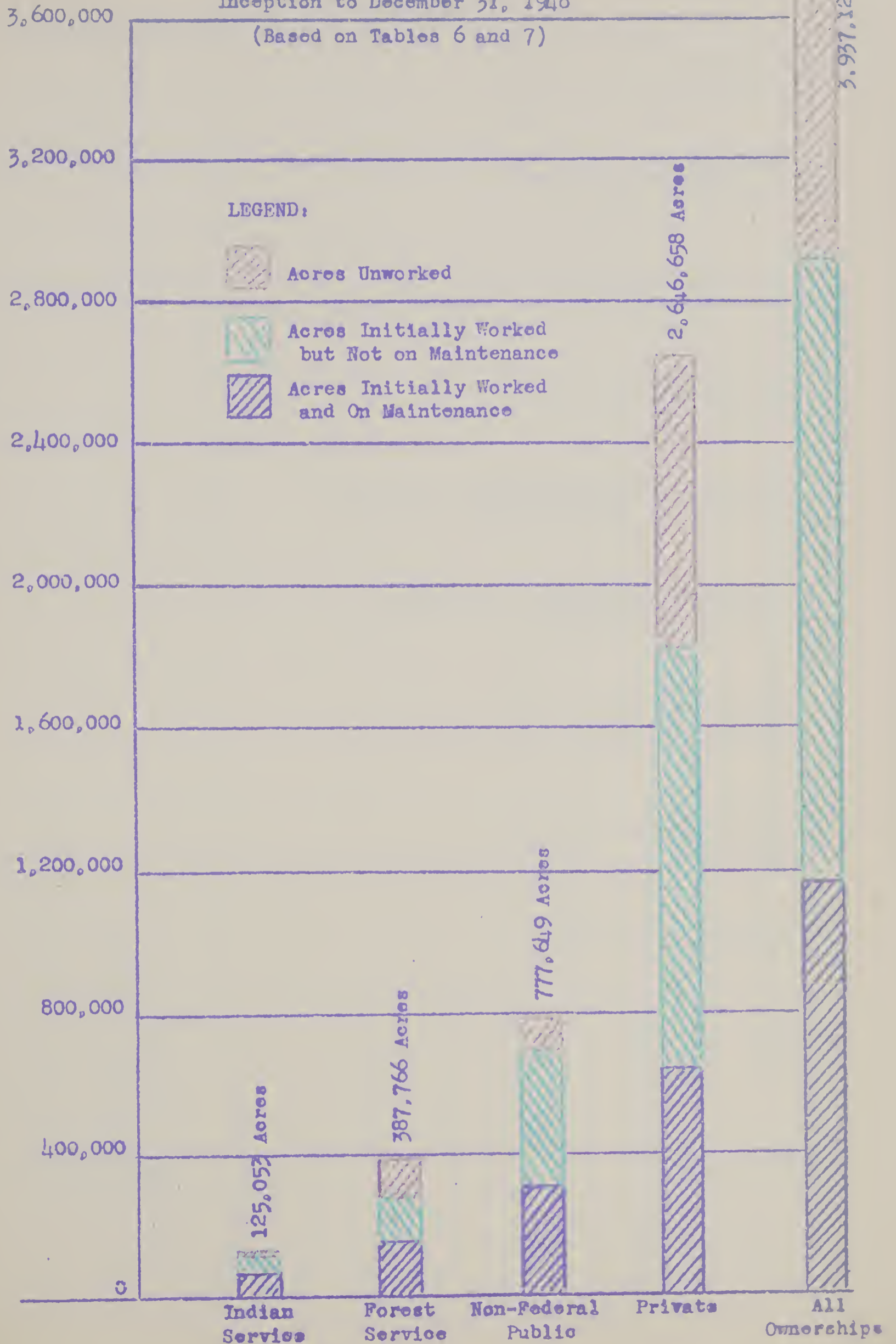
Present Goal is 3,937,126 Acres Control Area on Maintenance

CHART 6

STATUS OF CONTROL BY OWNERSHIP CLASSES, ALL STATES
NORTH CENTRAL REGION
Inception to December 31, 1948

(Based on Tables 6 and 7)


ACRES IN CONTROL AREA




Ribes Destroyed per Acre by States and Ownership Classes: All Workings,
Inception to December 31, 1948


NORTH CENTRAL REGION
(Based on Table 8)

 Forest Service Ownership

 Indian Service Ownership

 Non-Federal Public Ownership

 Private Ownership

 All Ownership

108.1 Ribes

Ribes Bushes Destroyed per Acre

200

150

100

50

0

125.5 Ribes

91.2 Ribes

61.7 Ribes

56.5 Ribes

41.0 Ribes

12.8 Ribes

4.9 Ribes

45.6 Ribes

50.6 Ribes

55.6 Ribes

Indiana

Ohio

Michigan

Wisconsin

Illinois

Iowa

Minnesota

Forest Service

Indian Service

Non-Fed. Public

Private

All Ownership

R E G I O N



Nursery Sanitation

Work Done 1948

There were four nurseries given sanitation workings during 1948. Three were state-owned and one county-owned. There were 1,790 ribes removed from 1,456 acres of control area at a cost of 98 man-days. This work provided protection for approximately 5,926,000 white pine trees. In protecting nurseries against blister rust, the full 1500-foot protection zone for all ribes and one-mile wide zone for cultivated black currants are maintained. The reason for this additional protection width is because nursery stock is often grown under overhead watering systems which create more or less optimum infection conditions. In order to maintain ribes-free conditions and to insure so far as possible the production of rust-free white pine planting stock, periodic workings of white pine growing nurseries are performed at least every two years. At the present time, practically all of our white pine producing nurseries, except a few private nurseries, have been protected, and the problem involves chiefly the maintenance of this protection work. Nursery sanitation performed in 1948 is shown in Table 9.

Present Status of Nursery Sanitation

The following table, taken from Omnibus Table E, shows the present status and cumulative work done, 1918 to 1948, in nursery sanitation in this Region:

State	Number Nurseries Worked			Total	Total	Total
	Protective Zones			Acres	Ribes	Man-days
	Retained	Dropped	Total	Worked	Destroyed	Used
Illinois	5	3	8	2,520	50,378	378
Indiana	2	4	6	3,750	11,351	60
Iowa	7	2	9	3,436	67,106	824
Ohio	5	9	14	6,616	60,645	1,910
Michigan	7	6	13	4,686	1,112,867	16,322
Minnesota	6	11	17	5,804	1,325,183	5,017
Wisconsin	10	7	17	4,985	887,917	8,483
Region total	42	42	84	31,791	3,515,447	32,994

The usual reasons for not maintaining nursery sanitation zones around white pine producing nurseries are that such nurseries discontinued the growing of white pine, or the prevalence of ribes made the sanitation work too costly to maintain.

Control Area Permits

As defined in Federal Quarantine 63, the States of Michigan, Minnesota, Ohio and Wisconsin are White Pine Control Area States. The interstate movement of ribes into designated control areas within these States can only be done if each ribes shipment carries a control area

permits issued by the proper State Plant Quarantine Officer. The issuing of control area permits is a function of the State which has been carried on for several years. Previous to 1943, however, no record on this activity has been made in our Annual Reports. A description of the procedure in issuing control area permits is given in the 1943 Annual Report, and will not be repeated here.

As noted in Table 5, during 1948, out of 785 applications for ribes shipping permits, 87.1 percent were approved. The large majority of the shipments were made in the spring.

Violations of Federal Quarantine 63

As reported by the Division of Domestic Plant Quarantine, during the fiscal year 1948, there were only two violations of Federal Quarantine 63, one intercepted at Chicago and the other at St. Paul, as ribes shipped without permits, one shipment to Michigan and one to Minnesota. This is decidedly smaller than the 20 violations reported going to the states of this region in 1947. In fact, for the whole United States, there were only nine violations of Federal Quarantine 63 in fiscal year 1948.

Cultivated Black Currant Elimination

The only work under this heading in 1948 was the destruction of 98 cultivated black currant plants in 15 plantings. To the end of 1948 in the Region, 288,740 cultivated black currant bushes in 34,789 plantings had been destroyed. There remain 986 known plantings with 6,618 cultivated black currant bushes not yet destroyed. Thus, 97.7 percent of all known bushes have been eliminated.

Canker Pruning

A limited amount of canker pruning in protected areas was performed in six states, as noted in Table 14. In 1948, there were 19,301 cankers removed. There were 12,260 trees treated, some of which were crop trees silviculturally pruned. To date, 172,815 cankers have been removed from 79,954 trees, and 3,208 infected trees have been cut down, chiefly in Minnesota, Michigan and Iowa. It is believed that when adequate labor is again available, canker pruning on selected crop trees in a protected stand can be economically justified, as a control measure.

Informational Activities

Information about blister rust and its control was carried to the cooperating agencies and to the general public through the media of Fair Exhibits, displays, a few radio talks, newspaper articles, addresses at meetings, correspondence, bulletins, reports, and by direct personal contact. As an increasing amount of effort is being directed toward the

securing of private cooperation, more direct contacts by the leaders and Field Supervisors with private pine owners are being made with good results.

Two new blister rust films became available in 1948, "Blister Rust - Enemy of White Pines" and "Paul Bunyan Had a Son". Both were shown extensively and were well received by all types of audiences. The picture, "Paul Bunyan Had a Son" was filmed in the North Central Region and is particularly in demand in this Region because of its local color. By the end of the year so much interest had been generated by it that the number of available copies of this film was insufficient to fill the demand for showings at schools, 4-H Clubs, Conservation groups, Service Clubs, etc. Additional copies have been ordered and will be used extensively through the remaining winter months.

Experimental Chemical Eradication of Ribes

Follow-up inspections of previously treated ribes plots, and further applications of the hormone type chemical compounds, were made in 1948. Observations made on plots treated with 2,4-Dichlorophenoxyacetic acid (2,4-D) solutions in 1947, revealed rather disappointing results. It was found that considerable survival and sprouting occurred in all species of ribes treated with the exception of *R. americanum*. This species appears to be very susceptible to even comparatively weak solutions of 2,4-D sprayed on the aerial parts of the plant. Its destruction can therefore be brought about and some practical field work in its removal from certain areas has already been undertaken by spraying the plants with aqueous solutions of 2,4-D at the rate of 1,000 parts per million. Results observed at Evergreen Park at Sheboygan, Wisconsin, described in the section on Local Control, have shown that not only does the chemical application accomplish a more complete kill of wild black currants than is possible with hand pulling methods, but that it can be done at considerably less cost.

Because of the ineffectiveness of the 2,4-D formulations applied in 1947 on most ribes species, further work was done in 1948 using stronger concentrations of 2,4-D, and the newer hormone type weed killer, 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T).

Experiments in chemical ribes eradication for 1948 were started in the North Central Region on May 18. Armed with information gathered from various sources during the winter months, including a visit to the Dow Chemical Plant at Midland, Michigan, it was decided to concentrate on 2,4,5-Trichlorophenoxyacetic Acid (2,4,5-T) as a ribicide. The Dow Company supplied us with one gallon each of 43% isopropyl ester and 40% amine salt of 2,4,5-T plus one gallon of "Esteron 44" (44% butyl ester of 2,4-Dichlorophenoxyacetic acid) (2,4-D).

Five plots, 1/3 chain wide x 1 chain long, were established on the eastern side of the Menominee Indian Reservation on May 18. Each embraced two or more of five species of wild ribes: *Ribes americanum*, *R. cynosbati*, *R. Triste*, *R. glandulosum* and *R. lacustre*. Aqueous sprays of isopropyl ester of 2,4,5-T were applied to the foliage in three of the plots in

concentrations of 6,000, 3,000 and 1,000 parts per million. A combination of 2,4,5-T and Esteron 44 at 3,000 ppm each was applied to the fourth plot and Esteron 44 alone at 3,000 ppm to the fifth. The ribes were plainly visible and not screened too much by associated brush. Garden pressure sprayers of 3-gallon capacity were used. The spray was directed at ribes only and did not cover the entire plot. Results on these plots were observed on August 31, three and one-half months after treatment. They are encouraging but not absolute. R. hirtellum, glandulosum, triste, lacustre treated with 6,000 ppm 2,4,5-T appeared dead.

At 3,000 ppm this chemical appeared to have killed R. cynosbati and R. triste and 92% of the R. glandulosum but new sprouts were observed on 8% of the skunk currant bushes. Only these three species were in this plot.

At 1,000 ppm the 2,4,5-T seemed to be equally effective having apparently killed all of the R. cynosbati, R. triste, and R. lacustre, and 91% of the R. glandulosum. These were the only four species in this plot.

The combination of 3,000 ppm each of 2,4,5-T and Esteron 44 appeared to be somewhat less effective, having apparently killed all R. cynosbati and R. lacustre but only 90% of the R. glandulosum and 65% of the R. triste bushes. New sprouts were observed on 10% of the skunk and 35% of the red currant plants.

Esteron 44 alone, at 3,000 ppm on the fifth plot was effective only on R. cynosbati which it apparently killed, but had slight effect on R. glandulosum, R. triste and R. lacustre which not only retained many of their old leaves but had new leaves and sprouts as well.

Bushes in all five plots seemed to have been pretty well covered by the sprayers and there was no evidence of individual plants having been missed. This can be ascribed to the optimum conditions which prevailed for seeing ribes when they were sprayed on May 18.

Four additional plots were treated at this location on June 9, 1948. Aqueous solutions of 2,4,5-T were applied to the foliage. Two of the plots were treated with the isopropyl ester of 2,4,5-T and the other two with the 40% amine salt of 2,4,5-T. Concentrations of 6,000 and 3,000 ppm were used. Readings were taken on August 31, about two and one-half months after treatment.

The solution of 6,000 ppm isopropyl ester of 2,4,5-T apparently killed all three species treated: R. cynosbati, R. glandulosum and R. lacustre.

At 3,000 ppm the same chemical applied to two species killed all of the lacustre and 97% of the R. glandulosum plants. It is surmised that complete kill was not obtained on R. glandulosum because the sprayer probably missed screened parts of 3 plants.

The 40% amine salt of 2,4,5-T at 6,000 ppm applied to R. cynosbati and R. glandulosum killed 95% of the former and 94% of the latter. Again it was felt that lack of complete kill was not due to the ineffectiveness of the chemical but rather that hidden parts of a few plants had not been sprayed.

Amine salt of 2,4,5-T at 3,000 ppm did not produce the degree of kill that a solution twice as strong gave. It appeared to have killed 80% of the R. cynosbati and R. glandulosum and only 60% of the R. lacustre. Twenty percent of the R. lacustre bushes had new sprouts.

A series of 11 plots (1/3 chain x 1/2 chain) were established in Langlade County, Wisconsin, on June 10, 1948. These were ideal plots as most of them contained five and six species of wild ribes. Aqueous solutions of the ester and amine salt were applied to the foliage at concentrations of 12,000, 6,000, 3,000 and 1,000 ppm. Esteron 44 was also used.

Readings were taken on September 1, 1948.

It was found that 2,4,5-T at 12,000 ppm apparently killed all the R. cynosbati and R. glandulosum and from 80 to 90 percent of the R. hirtellum, R. triste, and R. lacustre bushes. New growth and new sprouts were observed on a few R. hirtellum and R. triste.

At 6,000 ppm the spray apparently killed all R. cynosbati, R. glandulosum and R. hudsonianum and 90% of the R. hirtellum. Probably due to insufficient coverage the remaining 10% of R. hirtellum survived. Most of the R. lacustre bushes retained old leaves and sprouted new ones.

3,000 ppm apparently killed R. cynosbati, R. hirtellum, and R. hudsonianum and 90% of the R. glandulosum. One skunk currant had one new sprout. All R. lacustre and R. triste had some old growth and some new growth.

The aqueous solution of 1,000 ppm 2,4,5-T apparently killed all of the R. cynosbati bushes and 90% of the R. hirtellum. The other 10% had new sprouts. The concentration did not appear strong enough to kill R. triste and all the plants of this species retained old live stem. R. lacustre was least affected and not only retained old live stem but grew many new leaves and sprouts.

In general R. lacustre appeared to be most resistant to 2,4,5-T.

The aqueous solutions of Dow A-816 (40% amine salt of 2,4,5-T) applied at the same time and place and at the same concentrations as 2,4,5-T ester produced similar results except that there was less sprouting.

At 12,000 ppm it apparently killed R. cynosbati, R. hirtellum, R. triste and R. hudsonianum bushes and 99% of the R. glandulosum and R. lacustre. No sprouts resulted with this concentration.

The 6,000 ppm concentration seemed to be about equally effective except that one R. lacustre had new sprouts.

A-816 at 3,000 ppm appeared to have killed all R. cynosbati, R. hirtellum, R. triste and R. hudsonianum and about 70% of the R. glandulosum and 60% of the R. lacustre. New sprouts had appeared on some of the bushes of these last two species.

Somewhat similar results were obtained with A-816 at 1,000 ppm.

All of the R. cynosbati and R. triste appeared dead but old stem remained alive on 20% of the R. hirtellum and 10% of the R. glandulosum plants. These were no new sprouts.

Another plot was sprayed with 3,000 ppm Esteron 44 in water. Only R. hudsonianum was killed. R. cynosbati, R. glandulosum, R. triste and R. lacustre not only retained most of their old leaves but produced new leaves and sprouts as well.

A combination of 2,4,5-T and Esteron 44 at 3,000 ppm each sprayed as an aqueous solution on foliage of ribes produced varying results. It killed R. hudsonianum, and 90% of the R. glandulosum and 50% of the R. hirtellum. New sprouts appeared on 20% of the R. hirtellum.

Additional ribes were sprayed in Langlade County, Wisconsin, with 2,4,5-T solutions on September 2, 1948 but no definite conclusions on effectiveness can be drawn at this time because of the lateness of the season.

Several plots were also established near Wolverine, Cheboygan County, Michigan. Sprays, both foliage and basal were used. Chemicals used were ester of 2,4,5-T, amine salt of 2,4,5-T, and Esteron 44 in both water and oil. Concentrations ranged from 24,000 to 1,000 ppm. They were applied on July 7 and August 20, 1948, and results observed on September 30, 1948.

In all cases R. americanum was killed by the various solutions and concentrations used, either as foliage or basal stem treatments.

R. cynosbati appeared to be next susceptible. It was killed by a foliage spray of 12,000 ppm in kerosene and by a basal application of 24,000 ppm ester of 2,4,5-T in kerosene. It was not seriously affected, however, by basal sprays of 12,000 ppm ester of 2,4,5-T in kerosene or 24,000 ppm or less of 2,4,5-T in water. Neither did 24,000 ppm amine salt of 2,4,5-T or Esteron 44 in water kill R. cynosbati when only the basal uncut stems were treated.

Results on R. hirtellum varied. In one case this species was killed by an aqueous foliage spray of 6,000 ppm ester of 2,4,5-T and in another by a combination aqueous foliage spray of 1,000 ppm each of amine salt of 2,4,5-T and Esteron 44. Yet it survived foliage sprays of 12,000 and 6,000 ppm ester of 2,4,5-T in kerosene and 3,000 ppm of the same chemical in water. These sprays were all applied on the same day, July 8, 1948.

R. glandulosum also reacted in different ways to various sprays. It appears to have been killed by all concentrations of the amine salt of 2,4,5-T (1,000-6,000 ppm) applied as aqueous foliage sprays. It also succumbed to a foliage spray of 12,000 ppm ester of 2,4,5-T in kerosene and strangely enough, in one instance, to a foliage spray of only 1,000 ppm ester of 2,4,5-T in water. On the other hand kerosene sprays of 2,4,5-T at 1,000, 3,000 and 6,000 ppm produced kill ranging from 75 - 99 percent. Aqueous sprays of the ester of 2,4,5-T at concentrations of 1,000, 3,000 and 6,000 ppm with the one exception mentioned above, yielded apparent kill of from zero to 99 percent. These sprays were applied on July 8, 1948.

Unfortunately, R. triste was not treated with the amino salt of 2,4,5-T at the Wolverine plots. Ester of 2,4,5-T at 12,000 ppm in kerosene resulted in an apparent 100% kill of R. triste and at 6,000 ppm a 95% kill. Aqueous solutions of 3,000 ppm killed 100% of the R. triste sprayed on July 9 while a 24,000 ppm solution applied on August 20 killed only 95% of this species.

There were no R. lacustre or R. hudsonianum at the Wolverine plots.

A number of ribes plants were given aqueous foliage sprays using ester of 2,4,5-T at concentrations ranging from 1,000 to 24,000 ppm at Escanaba, Michigan, on July 1, 1948. As much "Dreft" as would dissolve was added to the water to act as a spreader. This series of treatments appears to be one of the most successful of those tried during the year.

Ribes americanum, R. cynosbati, R. hirtellum, R. glandulosum and R. triste all appeared to be dead six weeks after treatment. Concentrations of 1,000 ppm appeared to be just as effective as 24,000 ppm. Only one clump of bushes survived and oddly enough it was R. glandulosum sprayed with a 24,000 ppm concentration. A nearby clump of the same species was treated in the same way and it died as did others treated with weaker solutions. We are at a loss to know why this particular clump survived.

In Minnesota several species of ribes were treated with aqueous solutions of Dupont 46% ester of 2,4-D at strengths ranging from 6,000 to 60,000 ppm in foliage sprays.

R. americanum was killed by concentrations of 12,000 ppm and stronger; R. hirtellum, 24,000 ppm and stronger; R. cynosbati and R. triste, 36,000 ppm and stronger.

R. cynosbati survived with numerous new sprouts, a foliage spray of 60,000 ppm in kerosene applied as early as May 5. Decapitated ribes, except R. americanum, sprouted profusely after being treated with concentrations of 120,000 ppm Dupont 46% ester of 2,4-D in fuel oil. Species treated included R. cynosbati, R. hirtellum, and R. glandulosum.

Sprouting also occurred on decapitated R. cynosbati and R. hirtellum treated with 60,000 ppm Esteron 44 in fuel oil.

Some sprouting was also observed on decapitated R. americanum treated with solutions of 2,4-D.

From the foregoing observations it would appear that:

1. Good results can be expected on R. americanum and R. hudsonianum using aqueous foliage sprays of either 2,4,5-T or 2,4-D at concentrations of 1,000 ppm.
2. Basal sprays on upright bushes such as R. americanum and R. cynosbati hold promise. A solution of 24,000 ppm ester of 2,4,5-T in kerosene sprayed on the stems of the plants from the ground line to the lower branches apparently killed R. americanum and R. cynosbati.

3. Aqueous foliage sprays of 2,4,5-T at concentrations of 1,000 ppm and stronger, with a saturated solution of "Dreft" in the water apparently killed all species of ribes treated.
4. 2,4,5-T is more toxic to ribes than 2,4-D.
5. 2,4-D when used in strong enough concentrations (36,000 ppm or stronger) in aqueous foliage sprays will apparently kill several species of ribes including R. cynosbati and R. triste.
6. Early season applications give better results than late season treatments because of more active growth and greater ease in finding the ribes in spring.
7. Less new growth or sprouting appears after aqueous foliage sprays with amine salt of 2,4,5-T than with ester of 2,4,5-T.
8. In foliage sprays there is less new growth or sprouting with water solutions than with oil solutions.
9. In basal stem treatments, oil solutions are more effective than water solutions.
10. Treatment of decapitated ribes with 2,4-D and 2,4,5-T solutions have been unsatisfactory in the North Central Region. Too much sprouting.
11. A follow-up spray is needed to get the plants that were missed by the sprayer and sprouts that may appear after the initial treatment.
12. In their order of susceptibility to 2,4-D and 2,4,5-T formulations, Ribes ranked as follows: (Most susceptible first)

<u>2,4-D</u>	<u>2,4,5-T</u>
1. <u>R. americanum</u>	1. <u>R. americanum</u>
2. <u>R. hudsonianum</u>	2. <u>R. hudsonianum</u>
3. <u>R. missouriense</u> (Not treated	3. <u>R. cynosbati</u>
4. <u>R. oxycanthoides</u> (in 1948)	4. <u>R. hirtellum</u>
5. <u>R. hirtellum</u>	5. <u>R. glandulosum</u>
6. <u>R. cynosbati</u>	6. <u>R. triste</u>
7. <u>R. lacustre</u>	7. <u>R. lacustre</u>
8. <u>R. triste</u>	
9. <u>R. glandulosum</u>	

Note: R. missouriense and R. oxycanthoides not treated with 2,4,5-T.

Costs

Cost figures for the Region during 1948 are shown in Tables 12 to 12C, for Milwaukee alone; by States and appropriations; by States and Activities; and by Activities and Appropriations.

A total of \$396,112.66 was spent during the calendar year, with the following percentage distribution by sources:

State and Private	17.8 percent
Bureau 3101 and 71	23.9 percent
Bureau 3103 and 73	9.2 percent
Forest Service 3104 and 74	27.8 percent
Indian Service 3107 and Tribal	21.3 percent
<hr/>	
Total	100.0 percent

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATE LANDS IN THE
NORTH CENTRAL REGION, 1948, WORK PROJECT BLR-3-3

Objective of Cooperative Project

The purpose of this cooperative project is to control white pine blister rust on all non-federal lands, both public and private. Non-Federal Public and Private funds are matched by Regular Federal Funds in so far as appropriations are available. These funds are administered cooperatively by the Bureau of Entomology and Plant Quarantine and State agencies concerned and are spent for control on state and private lands.

Cooperative Expenditures in 1948

During 1948, as noted in Text Table 4, \$55,860.62 were spent as Direct Aid by state and private cooperators, including states, counties, municipalities and individuals, on the protection of state and privately-owned white pine against blister rust. Matching these funds the Bureau of Entomology and Plant Quarantine spent a total of \$36,300.58 of 3103 and 73 funds. Thus, a total of \$92,161.20 was spent on local control on state and private lands in this Region.

Control Accomplishments, 1948

In Text Table 1, local control accomplished on Regular-Cooperative funds on state and private lands is shown. It will be noted that under all workings 26,502 acres of white pine were given protection by the removal of 632,235 ribes from 89,315 acres of control area at a cost of 4,966 man-days.

Compared to recent previous years this represents a falling behind of the control schedule for the protection of state and privately-owned pine by 25percent as compared with 1947 and 66 percent as compared with the amount of pine protected in 1946. Although state and private agencies increased their cooperative contribution toward the work the increase was not sufficient to offset the drastic cut in federal funds for work on lands of this class of ownership which was made beginning July 1, 1947.

The Bureau of Entomology and Plant Quarantine used its funds primarily for labor. State and Cooperative funds were used in the employment of labor, supervisors, the assignment of state and county men to control work, the employment of owners of white pines, etc. To a greater or lesser degree, owners contributed toward the protection of their own stands in all of the states. Examples of other types of cooperation on the part of states may be given.

In Wisconsin, several counties used County Forest Crop Law funds for the employment of ribes eradication labor on county forests.

In Minnesota the Oliver Iron Mining Company and several other pine owners contributed funds or hired labor directly for the protection of their white pine. Private cooperation, in the form of funds or labor was also provided by several pine owners in Michigan. The cooperating States provided funds or labor for the protection of state-owned pine stands. In total, these cooperative contributions exceeded the amount of federal matching funds available for work on state and private lands under the cooperative agreements.

Effect of Reduction in Funds on Cooperative Program

During the calendar year 1946 a reasonably adequate program of control on state and private lands was carried out, in general accord with the 5 Year Program. This program had for its purpose the completion of initial work and bringing up to date all necessary rework on state and private lands. Funds available for this work in 1947 and 1948 fell far short of what was needed to live up to this program and to prevent heavy losses of white pine to the rust.

During 1946 we removed ribes from 241,419 acres of control area to protect 77,849 acres of white pine on state and private lands. If work had continued on the 1946 scale in 1947 and 1948 we would have worked approximately 724,200 acres to protect 223,500 acres of white pine during the three year period. Because of reduced funds in 1947 and 1948 we actually worked 452,711 acres and protected 140,013 acres of white pine in state and private ownership. Thus there were 271,489 acres of control area and 83,487 acres of white pine which were not worked, and which presumably would have been worked if funds had remained at the 1946 level in 1947 and 1948. With rust abundantly present in the region this can only mean that valuable white pine resources are being lost to the rust, due to inability to work them in time.

Status of Control

In order that a complete record may be available for all work done under the Regular-Cooperative program, Text Table 2 has been devised to show all work since inception in 1942 through 1948.

The status of control on state and private lands in this Region as of December 31, 1948 is shown in Text Table 3 and graphically in Chart 8. This total control problem includes 3,424,187 acres, approximately four-fifths of which is around privately-owned white pine.

Of the total control area, nearly 74 percent has been initially worked, and over 27 percent is on maintenance. Thus, while progress has been made in the protection of state and privately-owned white pine, there remains a great amount of work to be done before all control work is accomplished, and such stands are in a state of maintenance.

Text Table 1. Summary of Local Control on State and Private Lands,
North Central Region, 1948, Bureau-State Funds, B.L.R.-3.

State	Ownership Class	Acres White Pine			Acres Worked	Ribes Destroyed	Man- Days Used
		Protected		Total			
		Natural	Planted				
<u>Initial Working</u>							
Illinois	Private	-	20	20	108	182	1
Indiana	Private	-	48	48	500	43	4
Iowa	Non-Fed. Public	-	5	5	40	7,321	30
	Private	10	14	24	140	16,867	115
	Total	10	19	29	180	24,188	145
Ohio	Non-Fed. Public	-	115	115	477	5,102	71
	Private	-	175	175	1,469	779	13
	Total	-	290	290	1,946	5,881	84
Michigan	Non-Fed. Public	330	25	355	980	2,279	72
	Private	1,128	68	1,196	3,103	22,505	250
	Total	1,458	93	1,551	4,083	24,784	322
Minnesota	Private	95	23	118	489	38,918	151
Wisconsin	Non-Fed. Public	5,372	217	5,589	18,896	102,733	579
	Private	7,486	159	7,645	33,207	29,308	201
	Total	12,858	376	13,234	52,103	132,041	780
Region	Non-Fed. Public	5,702	362	6,064	20,393	117,435	752
	Private	8,719	507	9,226	39,016	108,602	735
Region Total, Initial		14,421	869	15,290	59,409	226,037	1,487

Text Table 1. Summary of Local Control on State and Private Lands,
North Central Region, 1948. Bureau-State Funds, B.L.R.-3.
(Cont'd.)

State	Ownership Class	Acres White Pine			Acres Worked	Ribes Destroyed	Man- Days Used
		Protected		Total			
		Natural	Planted				
<u>Second Working</u>							
Illinois	None	-	-	-	-	-	-
Indiana	Private	-	307	307	1,003	-	1
Iowa	Non-Fed. Public	1	51	52	210	19,514	11
	Private	-	11	11	26	2,129	74
	Total	1	62	63	236	21,643	85
Ohio	Non-Fed. Public	-	251	251	1,482	1,693	55
	Private	-	276	276	2,568	1,142	87
	Total	-	527	527	4,050	2,835	142
Michigan	Non-Fed. Public	1,310	88	1,398	3,102	8,253	90
	Private	1,406	-	1,406	3,165	52,482	300
	Total	2,716	88	2,804	6,267	60,735	390
Minnesota	Non-Fed. Public	335	-	335	550	21,526	205
	Private	25	-	25	150	6,380	51
	Total	360	-	360	700	27,906	256
Wisconsin	Non-Fed. Public	955	520	1,475	2,951	37,676	272
	Private	862	119	981	3,452	8,632	137
	Total	1,817	639	2,456	6,403	46,308	409
Region	Non-Fed. Public	2,601	910	3,511	8,295	88,662	771
	Private	2,293	708	3,001	10,454	70,765	518
Region Total, Second		4,894	1,618	6,512	18,749	159,427	1,300

Text Table 1. (Cont'd.) Summary of Local Control on State and Private Lands,
North Central Region, 1948. Bureau-State Funds,
B.L.R.-3.

State	Ownership Class	Acres White Pine			Acres Worked	Ribes Destroyed	Man- Days Used
		Protected		Total			
		Natural	Planted				
Third and Other Workings							
Indiana	Private	-	25	25	125	252	2
Iowa	Non-Fed. Public	5	10	15	84	5,655	47
	Private	-	1	1	5	14	2
	Total	5	11	16	89	5,669	49
Ohio	Private	-	39	39	233	108	3
Michigan	Non-Fed. Public	264	196	460	1,073	2,078	91
	Private	2,078	6	2,084	5,551	25,632	387
	Total	2,342	202	2,544	6,624	27,710	478
Minnesota	Private	145	100	245	692	61,546	371
Wisconsin	Non-Fed. Public	907	844	1,831	3,394	151,486	1,276
Region	Non-Fed. Public	1,256	1,050	2,306	4,551	159,219	1,414
	Private	2,223	171	2,394	6,606	87,552	565
Region Total, Third		3,479	1,221	4,700	11,157	246,771	2,179
All Workings							
Illinois	Private	-	20	20	108	182	1
Indiana	Private	-	375	375	1,718	295	7
Iowa	Non-Fed. Public	6	66	72	334	32,490	189
	Private	10	26	36	171	19,010	141
	Total	16	92	108	505	51,500	330
Ohio	Non-Fed. Public	-	366	366	1,959	6,795	136
	Private	-	490	490	4,270	2,029	45
	Total	-	856	856	6,229	8,824	181
Michigan	Non-Fed. Public	1,904	309	2,213	5,155	12,610	253
	Private	4,612	74	4,686	11,819	100,619	939
	Total	6,516	383	6,899	16,974	113,229	1,192
Minnesota	Non-Fed. Public	335	-	335	550	21,526	283
	Private	265	123	388	1,331	106,844	543
	Total	600	123	723	1,881	128,370	826
Wisconsin	Non-Fed. Public	7,314	1,581	8,895	25,241	291,895	2,097
	Private	8,348	278	8,626	36,659	37,940	332
	Total	15,662	1,859	17,521	61,900	329,835	2,429
Region	Non-Fed. Public	9,559	2,322	11,881	33,239	365,316	2,958
	Private	13,235	1,386	14,621	56,076	266,919	2,008
Region Total, All Workings		22,794	3,708	26,502	89,315	632,235	4,966

Text Table 2. Cumulative Summary of Local Control on State and Private Lands, North Central Region, 1942-1948, Bureau-State Funds, BLR-3.

State	Ownership Class	Acres White Pine			Acres Worked	Ribes Destroyed	Man- Days Used
		Protected		Total			
		Natural	Planted				
<u>Initial Working</u>							
Illinois	Non-Fed. Public	-	68	68	922	16,435	97
	Private	-	363	363	6,296	129,327	413
	Total	-	431	431	7,218	145,762	510
Indiana	Non-Fed. Public	-	204	204	2,139	2,622	28
	Private	3	2,536	2,539	17,823	76,235	367
	Total	3	2,740	2,743	19,962	78,857	395
Iowa	Non-Fed. Public	60	126	186	1,652	179,515	1,447
	Private	98	127	225	2,195	172,126	1,698
	Total	158	253	411	3,847	351,641	3,145
Ohio	Non-Fed. Public	-	1,193	1,193	4,219	24,612	578
	Private	127	2,316	2,443	18,774	54,524	573
	Total	127	3,509	3,636	22,993	79,136	1,151
Michigan	Non-Fed. Public	3,119	2,442	5,561	21,604	159,064	840
	Private	18,009	4,279	22,288	86,046	858,197	5,306
	Total	21,128	6,721	27,849	107,650	1,017,261	6,146
Minnesota	Non-Fed. Public	2,979	228	3,207	5,587	477,456	5,446
	Private	155	25	180	722	49,315	226
	Total	3,134	253	3,387	6,309	526,771	5,672
Wisconsin	Non-Fed. Public	37,815	4,959	42,774	132,358	596,152	4,009
	Private	54,722	1,768	56,490	162,858	724,038	4,242
	Total	92,537	6,727	99,264	295,216	1,320,190	8,251
Region	Non-Fed. Public	43,973	9,220	53,193	168,481	1,455,856	12,445
	Private	73,114	11,414	84,528	294,714	2,063,762	12,825
Region Total, Initial		117,087	20,634	137,721	463,195	3,519,618	25,270

Text Table 2 (Cont'd.) Cumulative Summary of Local Control on State and Private Lands, North Central Region, 1942-1948.
Bureau-State Funds, B.L.R.-3.

State	Ownership Class	Acres White Pine			Acres Worked	Ribes Destroyed	Man- Days Used
		Protected		Total			
		Natural	Planted				
<u>Second Working</u>							
Illinois	Non-Fed. Public	102	847	949	3,719	140,235	927
	Private	28	215	243	1,500	22,943	241
	Total	130	1,062	1,192	5,219	163,178	1,168
Indiana	Non-Fed. Public	-	922	922	5,000	12,465	162
	Private	87	1,124	1,211	9,268	30,008	137
	Total	87	2,046	2,133	14,268	42,473	299
Iowa	Non-Fed. Public	40	97	137	1,010	179,211	1,027
	Private	142	266	408	3,353	241,871	2,075
	Total	182	363	545	4,363	421,082	3,102
Ohio	Non-Fed. Public	-	1,523	1,523	7,412	10,735	265
	Private	290	1,045	1,335	9,404	43,301	574
	Total	290	2,568	2,858	16,816	54,036	839
Michigan	Non-Fed. Public	13,735	4,122	17,857	37,120	282,209	1,809
	Private	33,996	2,444	36,440	112,498	1,059,671	7,659
	Total	47,731	6,566	54,297	149,618	1,341,880	9,468
Minnesota	Non-Fed. Public	5,847	293	6,140	8,704	233,029	2,741
	Private	28	2	30	207	10,215	57
	Total	5,875	295	6,170	8,911	243,244	2,798
Wisconsin	Non-Fed. Public	16,845	5,837	22,682	49,580	444,101	4,115
	Private	39,920	1,042	40,962	114,424	933,032	9,492
	Total	56,765	6,879	63,644	164,004	1,377,133	13,607
Region	Non-Fed. Public	36,569	13,641	50,210	112,545	1,301,985	11,026
	Private	74,491	6,138	80,629	250,654	2,341,041	20,235
Region Total, Second		111,060	19,779	130,839	363,199	3,643,026	31,301

Text Table 2 (Cont'd.) Cumulative Summary of Local Control on State and Private Lands, North Central Region, 1942-1948.
Bureau-State Funds, B.L.R.-3.

State	Ownership Class	Acres White Pine Protected			Acres Worked	Ribes Destroyed	Man- Days Used
		Natural	Planted	Total			
		<u>Third and Other Workings</u>					
Illinois	Non-Fed. Public	90	254	344	2,376	100,493	695
	Private	5	577	582	2,502	50,764	588
	Total	95	831	926	4,878	151,257	1,283
Indiana	Non-Fed. Public	61	126	187	790	2,806	35
	Private	102	125	227	2,281	9,181	46
	Total	163	251	414	3,071	11,987	81
Iowa	Non-Fed. Public	266	10	276	934	92,821	908
	Private	27	4	31	363	22,935	209
	Total	293	14	307	1,297	115,756	1,117
Ohio	Non-Fed. Public	420	769	1,189	2,428	3,684	84
	Private	854	150	1,004	4,953	15,882	219
	Total	1,274	919	2,193	7,381	19,566	303
Michigan	Non-Fed. Public	2,413	3,465	5,878	11,942	60,428	870
	Private	9,830	279	10,109	30,022	292,429	2,811
	Total	12,243	3,744	15,987	41,964	352,857	3,681
Minnesota	Non-Fed. Public	2,491	179	2,670	3,179	85,294	880
	Private	153	275	428	1,186	95,710	628
	Total	2,644	454	3,098	4,365	182,004	1,508
Wisconsin	Non-Fed. Public	1,891	1,401	3,292	6,455	264,856	2,526
	Private	1,868	22	1,890	7,579	86,463	728
	Total	3,759	1,423	5,182	14,034	351,319	3,254
Region	Non-Fed. Public	7,632	6,204	13,836	28,104	611,392	5,799
	Private	12,839	1,432	14,271	48,886	573,364	5,229
Region Total, Third		20,471	7,636	28,107	76,990	1,184,756	11,028

Text Table 2 (Cont'd.) Cumulative Summary of Local Control on State and Private Lands, North Central Region, 1942-1948, Bureau-State Funds, B.L.R.-3.

State	Ownership Class	Acres White Pine			Acres Worked	Ribes Destroyed	Man- Days Used
		Protected		Total			
		Natural	Planted				
<u>All Workings</u>							
Illinois	Non-Fed. Public	192	1,169	1,361	7,017	257,163	1,719
	Private	33	1,155	1,188	10,298	203,034	1,242
	Total	225	2,324	2,549	17,315	460,197	2,961
Indiana	Non-Fed. Public	61	1,252	1,313	7,929	17,893	225
	Private	192	3,785	3,977	29,372	115,424	550
	Total	253	5,037	5,290	37,301	133,317	776
Iowa	Non-Fed. Public	366	233	599	3,596	451,547	3,382
	Private	267	397	664	5,911	436,932	3,982
	Total	633	630	1,263	9,507	888,479	7,364
Ohio	Non-Fed. Public	420	3,485	3,905	14,059	39,031	947
	Private	1,271	3,511	4,782	33,131	113,707	1,366
	Total	1,691	6,996	8,687	47,190	152,738	2,313
Michigan	Non-Fed. Public	19,267	10,029	29,296	70,666	501,701	3,319
	Private	61,835	7,002	68,837	228,566	2,210,297	15,776
	Total	81,102	17,031	98,133	299,232	2,711,998	19,095
Minnesota	Non-Fed. Public	11,317	700	12,017	17,470	796,779	9,067
	Private	336	302	638	2,115	155,240	911
	Total	11,653	1,002	12,655	19,585	952,019	9,978
Wisconsin	Non-Fed. Public	56,551	12,197	68,748	188,393	1,305,119	10,650
	Private	96,510	2,832	99,342	284,861	1,743,533	14,462
	Total	153,061	15,029	168,090	473,254	3,048,652	25,112
Region	Non-Fed. Public	88,174	29,065	117,239	309,130	3,369,233	29,310
	Private	160,444	18,984	179,428	594,254	4,978,167	38,289
Region Total, All Workings		248,618	48,049	296,667	903,384	8,347,400	67,599

Note: In Text Table 2, work done on State and Private Lands, by Bureau-State funds, and 3103 Intermingled Lands funds is shown, for the period 1942-1948 only, or since the Lee Act became effective. For total work done on State and Private Lands, 1917 to 1948, see Table 8.

Text Table 3. Status of Control on Non-Federal Public and Private Lands, by States,
North Central Region, December 31, 1948. Net Acres

Ownership Class	Total Control Problem, Acres			Initially Worked, Acres			Not Initially Worked, Acres		
	White Pine		Control Area	White Pine		Control Area	White Pine		Control Area
	Natural	Planted		Natural	Planted		Pine	Pine	
Illinois									
Non-Fed. Public	197	914	1,111	192	912	1,104	7	114	543
Private	34	798	832	34	742	776	56	2,115	58
Total	231	1,712	1,943	226	1,654	1,880	63	2,229	601
Indiana									
Non-Fed. Public(a)	99	2,388	2,487	99	2,335	2,434	52	1,346	1,537
Private	227	6,077	6,304	227	4,391	4,618	1,687	110,597	3,501
Total	326	8,465	8,791	326	6,726	7,052	1,739	111,943	5,038
Iowa									
Non-Fed. Public	348	211	559	348	210	558	1	20	11
Private	366	4,882	5,248	316	2,474	2,790	2,458	15,788	1,590
Total	714	5,093	5,807	664	2,684	3,348	2,459	15,808	1,601
Ohio									
Non-Fed. Public(b)	797	5,866	6,663	796	4,192	4,988	1,675	15,580	1,345
Private	2,287	10,950	13,237	2,174	6,748	8,922	4,315	267,890	3,146
Total	3,084	16,816	19,900	2,970	10,940	13,910	5,990	283,470	4,491
Michigan									
Non-Fed. Public	97,998	30,714	128,712	94,419	29,526	123,945	4,767	18,705	54,245
Private	194,265	13,576	207,841	171,318	11,357	182,675	25,166	96,743	52,801
Total	292,263	44,290	336,553	265,737	40,883	306,620	29,933	115,448	107,046

Text Table 3 (Cont.) Status of Control on Non-Federal Public and Private Lands, by State, North Central Region, December 31, 1948. Net Acres

Ownership Class	Total Control Problem, Acres			Initially Worked, Acres			Not Initially Worked, Acres			On Maintenance		
	White Pine			Control			White Pine			Control		
	Natural	Planted	Total	Natural	Planted	Total	White Pine	Control	White Pine	Control	White Pine	Control
Minnesota												
Non-Fed. Public	46,877	7,322	54,199	114,003	32,711	146,714	75,449	15,750	91,199	38,554	12,819	51,373
Private	84,817	383	85,200	271,426	66,312	337,738	265,813	18,507	284,320	65,613	14,967	80,577
Total	131,694	7,705	139,399	385,429	99,023	484,452	241,262	34,257	275,519	104,167	27,786	303,305
Wisconsin												
Non-Fed. Public	80,111	16,023	96,134	270,333	78,762	349,095	267,967	1,751	269,718	2,366	45,802	272,084
Private	252,116	8,365	260,481	1,028,014	203,804	1,231,818	769,664	49,770	819,434	258,350	86,110	905,544
Total	332,227	24,388	356,615	1,298,347	282,566	1,580,913	1,037,631	51,521	1,089,152	260,716	131,912	1,221,068
Region												
Non-Fed. Public	226,497	63,438	289,935	777,529	207,327	984,856	700,854	24,003	724,857	76,685	116,302	841,159
Private	534,112	45,031	579,143	2,646,658	444,185	3,090,843	1,829,552	101,959	1,931,511	817,096	162,173	2,093,607
Region Total	760,609	108,469	869,078	3,424,187	651,512	4,075,700	2,530,406	125,962	2,656,368	893,781	278,475	2,934,843
Includes U. S. Army Lands as follows:												
(a)	-	42	42	354	-	37	202	5	152	37	202	
(b)	-	156	156	1,675	-	136	1,237	20	438	51	474	

Text Table 4. Costs of Cooperative Control Program, BLR-3,
North Central Region, 1941 to 1948

State	Period of Time	State Direct Aid	Bureau 3103 and 73.14	Bureau Intermingled Lands 3103	Total
Illinois	1941-1947	\$27,418.58	\$21,836.05	-	\$49,304.63
	1948	4,113.05	512.28	-	4,625.33
	Total	31,531.63	22,398.33	-	53,929.96
Indiana	1941-1947	2,095.18	10,282.16	-	12,377.34
	1948	1,352.16	419.26	-	1,771.42
	Total	3,447.34	10,701.42	-	14,148.76
Iowa	1941-1947	15,898.32	43,355.91	-	59,254.23
	1948	692.68	5,465.03	-	6,157.71
	Total	16,591.00	48,820.94	-	65,411.94
Ohio	1941-1947	4,088.40	28,173.04	-	32,261.44
	1948	1,176.16	5,209.54	-	6,385.70
	Total	5,264.56	33,382.58	-	38,647.14
Michigan	1941-1947	52,975.49	107,970.77	17,660.34	178,606.60
	1948	11,151.16	8,697.97	-	19,849.13
	Total	64,126.65	116,668.74	17,660.34	198,455.73
Minnesota	1941-1947	41,407.22	109,384.44	32,490.17	183,281.83
	1948	13,572.05	4,995.84	-	18,567.89
	Total	54,979.27	114,380.28	32,490.17	201,849.72
Wisconsin	1941-1947	79,216.21	115,376.97	15,799.59	210,392.77
	1948	23,803.36	11,000.66	-	34,804.02
	Total	103,019.57	126,377.63	15,799.59	245,196.79
Region	1941-1947	223,099.40	436,429.34	65,950.10	725,478.84
	1948	55,860.62	36,300.58	-	92,161.20
Region Total		278,960.02	472,729.92	65,950.10	817,640.04

STATUS OF CONTROL FOR STATE AND PRIVATE LANDS, BY STATES
NORTH CENTRAL REGION
To December 31, 1948

(Based on Text Table 3)

ACRES IN CONTROL AREA

1,200,000

LEGEND:



Control Area
Acres Unworked



Control Area Acres Initially
Worked but Not on Maintenance



Control Area Acres
Initially Worked
and On Maintenance

1,050,000

900,000

750,000

600,000

450,000

300,000

150,000

0

Ill.

Iowa

Ind.

Minn.

Ohio

Mich.

Wis.

Non-Fed.
Public

Private

REGION

13,494 Acres

49,543 Acres

188,203 Acres

385,429 Acres

462,473 Acres

1,026,700 Acres

1,298,347 Acres

ACRES IN CONTROL AREA

2,400,000

2,100,000

1,800,000

1,500,000

1,200,000

900,000

600,000

300,000

0

777,529 Acres

2,646,658 Acres

BLISTER RUST CONTROL ON NATIONAL FORESTS,

NORTH CENTRAL REGION, 1948, PROJECT BLR-4

Objective

The objective of the Blister Rust Control Program on National Forests is to protect against blister rust all valuable white pine stands in Forest Service ownership. This involves initial and subsequent ribes eradication within infecting distances of white pine stands in order to bring such stands through to commercial maturity free from blister rust damage.

Memorandum of Understanding

Control work on National Forest lands is performed through a written Memorandum of Understanding between the Forest Service and the Bureau of Entomology and Plant Quarantine. The Forest Service is responsible for selection of pine areas to be protected, employment of labor and supervision, and operations of camps. The Bureau is responsible for the preparing of work plans and maps, keeping records, making reports, training of labor and supervision, and checking the adequacy of the control work.

Protective Zone Widths

Blister rust control involves the removal of ribes bushes within a pine stand and for a sufficient distance around it to assure protection. The width of the protection zone ranges from 50 to 900 feet, depending upon the forest type and screening afforded. In live swamps of alder, cedar, etc., the zone width is usually approximately 50 feet, or one crew width. Studies have failed to show serious damage to pines from swamp ribes, except for short distances. Ribes eradication in swamps is expensive. Due to perpetually moist conditions, and ability of ribes to regenerate by layering, it is almost impossible permanently to eradicate ribes in swamps. For these reasons, it is wiser to accept a small loss among pines bordering the swamps in preference to the relatively high cost of swamp ribes removal. The eradication of ribes in swamp borders removes those most dangerous to the pines.

The zone width in dense woodland is approximately 300 feet and in open woodland 600 feet. The screening effect of forest growth is such a deterrent to the movement of pine infecting spores produced on ribes that under most conditions little pine infection results from ribes beyond such protection zones. In the open a full 900 feet zone is maintained.

Rust Conditions

General Status for 1948

The year 1948 was abnormally dry and generally unfavorable for the spread of the rust. Prolonged periods of drouth and high temperatures in spring, summer and fall resulted in smaller amounts of infection on ribes than usual. These adverse weather conditions were also unfavorable to pine infection. Blister rust on either pine or ribes is present in greater or lesser degree on all forests in Michigan, Wisconsin and Minnesota. It is less abundant on the Huron and Manistee Forests in Lower Michigan. In the other six forests, it is well established throughout the white pine belt and is intensifying rapidly in unprotected stands. For the past decade natural white pine regeneration has been taking place. Unfortunately, however, in unprotected stands the present and potential loss of young white pines is far greater than the rate of establishment of new pines. This is particularly true on the Superior National Forest.

Significance of Present Rust Conditions

There are three recognized periods in the development of the rust; the introductory, intensification and climax. The introductory period of the rust has prevailed on the pines of the several National Forests of the Lake States for the past several years. It is going into the period of intensification on some forests where it has not been possible to maintain the required ribes eradication schedule. On the Superior it has already reached the climax stage in several unprotected areas. For a more detailed discussion of the three periods see the 1946 Regional Report.

General Status of Control

The status of control on the various National Forests of the Region is shown in Text Table 11 and on the accompanying map.

Local control work is about up to schedule on all Forests except the Superior. To date 67.8 per cent of the pine has been given initial protection and 30.4 per cent is on maintenance.

Local control work performed in 1948 is shown in Text Table 9 and is summarized below:

Local Control Performed on National Forests, North Central Region, 1948

Eradication	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man-Days Used
Initial	4,450	8,428	249,884	2,747
Reeradication	8,967	16,454	233,036	4,247
Total	13,417	24,882	482,920	6,994

It was much easier to secure men who were well qualified for blister rust control work during the past season than at any time since World War II. As a result, a better class of labor was obtained and in most instances both the quality of work and quantity of output per man-day improved. Also, because of the curtailment of funds for work on State and Private lands, the Bureau technical men had more time to devote toward the direction and checking of work on National Forests. Labor was largely paid from Forest Service Regular funds, (3104). Local men, and in a few instances, women were employed where they were available. High school boys were also recruited when there were not enough men. The boys were of an older age class than those used in recent past years and were better workers. Crews were made up of nearly all boys in camps operated on the Superior Forest.

In Text Table 10 are shown the results of systematic checking after the 1948 ribes eradication. For the entire work an average of 1.7 bushes with 4.3 feet of live-stem per acre was found. This is evidence of very good work, since the allowable maximum after eradication is 25 F.L.S. per acre. Approximately 98.7 percent of the 24,389 acres worked and checked, or all but 323 acres, showed less than 25 F.L.S. per acre after working.

A distinction should be made between "Gross" and "Net" acres worked. In Text Table 7, there are "Net" initially worked 276,281 acres. In Text Table 8, there are shown 317,309 "Gross" acres initially worked. "Gross" acres worked represent the yearly accumulation of acres worked. "Net" acres represent our best present knowledge of existing acreage retained in the control problem. Differences between "Gross" and "Net" represent acreages thrown out because pine values no longer are sufficient, due to logging, fire, grazing, etc.

Ribes Abundance by Forests

The abundance of ribes is not only a principal factor influencing the rapidity with which the rust intensifies, but it also directly affects the cost of protection. Since a considerable amount of control work has already been performed in most of the National Forests in this Region, the average number of ribes destroyed per acre for all workings to date may be of value. This information, taken from Text Table 8 is shown graphically in Chart 6. The number of ribes per acre on initial working varies from 2.5 on the Manistee National Forest, Michigan, to 145.7 on the Ottawa National Forest, Michigan. In general, listed in order of increasing ribes abundance on National Forests came those in Lower Michigan, then Upper Michigan, (except the Ottawa National Forest) Wisconsin and Minnesota.

Status of Control by Forests

NOTE: See 1943 Report for outline maps of each forest.

Manistee National Forest - Michigan

Of all the National Forests in the Region, the Manistee is the most suitable for white pine planting. It now contains 20,007 acres of planted white pine quite generally distributed over the forest. This is about 40 percent of the total white pine planted on National Forests in the Region and is more than the combined total white pine planting on any other three of them. All but 10 acres of the white pine, natural and planted, on the Manistee has now been initially worked, and over 96 percent of it is on a maintenance basis. Very fortunately, in the extensive oak forests under which white pine grows so well on the Manistee ribes are generally scarce except in certain moist spots. In 1948, initial working of 2,260 acres, second working of 1,021 acres, and third working of 654 acres was done, and 23,883 ribes were removed at a cost of 120 man-days.

The situation with respect to spread of blister rust on the forest remained practically unchanged in 1948. Rust on ribes has been reported as quite generally distributed. Light pine infection occurs in only a few widely scattered places on the Forest and there is no appreciable damage to pine anywhere.

Only a small amount of work is recommended for 1948. Only a very small amount of initial work is needed and some rework. An estimated 54 man-days of work should take care of the control problem in 1949. This includes 40 man-days to be expended on nursery sanitation work on the Chittenden Nursery and Annex. Through an excellent working arrangement between the Forest Supervisor and the Blister Rust Control Leader, the latter examines prospective white pine planting sites prior to planting in order to encourage the planting of white pine on sites where ribes are not abundant.

Huron National Forest - Michigan

The present control problem consists of 422 acres of natural pine, 1,001 acres of planted pine, within a total control area of 5,678 acres. All but 15 acres of this has been initially worked, and 66 percent of it is on maintenance. In 1948 only one area was worked; initial working, involving the removal of 11 ribes from 105 acres at a cost of 2 man-days. This small amount of work was done by a Bureau crew paid on 3104 funds.

Rust on ribes was generally light in 1948. There was no significant change in pine infection; it is generally light and occurs in only a few widely separated areas.

No control work is recommended for 1949, other than the checking of areas to be planted to white pine. The same excellent working agreement described for the Manistee is in effect on the Huron.

Marquette National Forest - Michigan

There are 11,323 acres of Federally-owned white pine considered worth protecting on the Forest of which 6,342 acres is natural and 4,981 acres is planted. All of it has been given initial protection. About 39 per cent is on maintenance.

Blister rust infection on pine is scattered lightly throughout the Forest.

Ribes are generally distributed over the Forest but occur in greatest numbers in Mackinac County especially in the swamps and streambeds.

As noted in Text Table 5, both initial and rework were performed in 1948. Initial work was done on 180 acres and rework on 840 acres. From the total of 1,020 acres worked 9,970 ribes were destroyed at a cost of 211 man-days.

All areas worked checked out satisfactorily, coming well within the regional standard of less than 25 feet of ribes live stem per acre.

Control work scheduled for the Forest in 1949 consists of rework only. A total of 4,670 acres of pine is involved requiring an estimated 740 man-days to keep it in safe condition.

Hiawatha National Forest - Michigan

There are 11,662 acres of federally-owned white pine on the forest that are included in the blister rust control problem. Natural reproduction is continuing to come in in certain parts thus steadily increasing the white pine acreage on the Forest.

Blister rust cankers are found scattered lightly over the Forest but there are no concentrated infection centers.

Ribes may be found in all parts of the Forest but the upland is generally light and most of the bushes are found in the swamps and drainages. Since swamps and streams are scattered all over the Forest it is seldom that a pine area is found that does not include at least a few acres of lowland in the control zone. For this reason it is usually necessary to perform a second and even a third working on the areas before they can be placed on maintenance.

The status of control is being kept pretty well up to schedule. All but 318 acres of pine have been given initial protection and 5,064 acres (43.4%) are on maintenance. Most of the remaining work to be done is rework.

Initial and rework was done on the Forest this year. On initial work a total of 2,150 ribes were removed from 1,020 acres of control area to protect 342 acres of pine at a cost of 38 man-days. Rework involved the removal of 9,555 ribes from 3,405 acres to protect 1,400 acres of pine at a cost of 156 man-days. (See Text Table 5).

The work schedule for 1949 includes 318 acres of pine for initial protection and 2,210 acres of pine needing rework. An estimated 362 man-days of labor will be required to do this work.

Ottawa National Forest - Michigan

There are 11,911 acres of Federally-owned white pine in the control problem on the Ottawa. Most of it is located in the eastern half of the Forest. As of December 31, 1948, initial protection has been given all but 436 acres and 3,593 acres (30.2%) are on maintenance.

Blister rust cankers are found in all parts of the Forest and the degree of pine infection is heavier than on any of the other National Forests in Michigan.

Ribes also occur more abundantly on the Ottawa than on any of the other Forests in Michigan. For this reason most of the areas must have one or more reworkings before they can be placed on maintenance.

Initial ribes eradication and rework were performed on the Iron River, Keweenaw and Ontonagon Ranger Districts in 1948. Field work was under Alfred J. Verville, a supervisor of several years successful Blister Rust Control experience. Most of the work was performed in June when a total of 56 men was employed. Initial work protected 288 acres of pine by removal of 49,603 ribes from 910 acres of control area at an expenditure of 414 man-days. Rework involved the removal of an additional 22,684 ribes from 1,866 acres of control area at a cost of 474 man-days to maintain protection on 980 acres of pine. All areas that were worked checked at less than 25 ribes feet of live stem per acre after working.

Preliminary work plans for 1949 indicate that an estimated 180 man-days for initial and 165 man-days for rework will be needed to keep the B.R.C. work on the Ottawa on schedule.

Nicolet National Forest - Wisconsin

The total control problem on the Nicolet includes 12,276 acres of federally-owned white pine, of which 5,883 is natural and 6,393 is planted. More than half of this acreage is located in the western part of the Eagle River District. Natural reproduction is on the increase wherever adequate seed trees are present on favorable sites. The planted acreage will probably continue to decrease unless new plantations are established. Encroachment of brush and hardwoods, deer browsing, and blister rust damage have all contributed to plantation failures. This is particularly true in the northern part of the forest. The most successful white pine plantations are found on the Lakewood District where more than half of the planted acreage is located.

Ribes are generally distributed throughout the Forest, more abundant in the hardwood types and scarce to absent on the lighter soils. On the Lakewood District, only one species, Ribes cynosbati, is generally found on the upland. Throughout the rest of the Forest, however, R. glandulosum and R. triste, are also present on most upland types.

Blister rust infection on pine is found in all parts of the Forest but is most severe in the northern part. On some unprotected areas, infection approaches 100 per cent. Light to medium infection is also present in protected stands. Most of this infection originated prior to initial ribes eradication. In natural stands, potential losses due to the rust are not alarming, however, as additional natural reproduction keeps coming in. Losses are much more serious in many plantations throughout the Forest, as they are not being replaced by new plantings or natural regeneration of any other valuable tree species.

Text Table 5 enumerates the control work done on the Forest in 1948. A total of 303 man-days was used to eradicate 18,953 ribes from 895 acres of control area in both initial and second workings. Five hundred seventy acres of white pine were protected. All the work scheduled for 1948 was not done because some of the same men that were employed on ribes eradication work were also used in tree planting. On the Lakewood District control work could not be started until the termination of tree planting in June. Consequently, there was insufficient time to complete all the scheduled work. Nevertheless, good progress was made and very satisfactory work was done.

The status of control on the Forest remains about the same as 1948, that is, 99 per cent of the pine has been given initial protection and 34 per cent is on maintenance.

Proposed work for the 1949 season includes both initial and rework. An estimated 620 man-days will be required to work 2,575 acres of control area to give and maintain protection on 1,735 acres of pine. Control work on the Nicolet is being kept pretty well on schedule.

Chequamegon National Forest - Wisconsin

The white pine acreage considered for protection on the Chequamegon rose from 16,768 in 1947 to 20,457 acres in 1948, an increase of 3,689 acres. This increase is largely due to the natural regeneration of white pine since previous surveys were made. Not only were entirely new areas of young white pine found in 1948 but an increase in the size of mapped areas was also noted. In making post-checks of previously worked areas additional pine acreage was added to nearly every pine area examined. Future surveys are expected to reveal additional increases in acreage of white pine reproduction.

To date 93.3 per cent of the total pine acreage has been given initial protection and 36.1 per cent is on maintenance.

Blister rust cankers are generally distributed among the white pine throughout the entire Forest. It varies in intensity from about two per cent in the Park Falls Ranger District where the pine areas are scattered and ribes range from light to medium in density, to about twenty per cent in the Washburn District where there are large contiguous pine areas and ribes range from medium to heavy. However, because of the blister rust control program which has been kept up to schedule on this Forest, white pine infection is on the decrease in all districts.

As noted in Text Table 5, both initial and rework was performed on the Forest in 1948. Exceptionally good progress was made. A total of 108,925 ribes was removed from 6,681 acres of control area at an expenditure of 2,883 man-days to protect 3,970 acres of white pine. All work was given the necessary check and found to be very satisfactory - in fact none of the acreage checked exceeded 15 feet of ribes live stem per acre after working.

Plans have been submitted for the Hayward, Glidden and Washburn Ranger Districts for work necessary in 1949. They involve an estimated expenditure of 1,750 man-days to work 3,808 acres of control area.

Superior National Forest - Minnesota

The Superior National Forest contains by far the largest amount of white pine of any of the forests in this Region. Listed in the control problem as worth protecting are 85,165 acres of white pine involving 135,008 acres of control area. This pine has practically all been mapped. It is conservatively estimated that in the inaccessible portions of the forest there exists an additional 100,000 acres of good white pine not yet mapped. During recent wet years white pine has seeded in and has become established at a rapid rate. Unfortunately, the same favorable climatic conditions and a great abundance of ribes closely associated with pines have resulted in an alarming intensification of the rust and the probable killing off of young white pine trees by blister rust in unprotected stands at a faster rate than their increase through natural reproduction.

The problem of furnishing protection to white pine stands on the Superior is an enormous one. To the end of 1948, 28,477 acres of pine had been initially protected. On the basis of mapped pine this represents approximately 33 percent initially protected. However, on the basis of total estimates of white pine worth protecting on the forest, or 185,165 acres, there has been only approximately 14 percent initially worked. Acreage of white pine on maintenance, 1,979 acres, is negligible.

In 1948 initial work was done on 2,870 acres, second working on 834 acres, and third working on 926 acres. Details are given in Text Table 5. In all 169,736 ribes were removed from 4,630 acres at a cost of 3,010 man-days. Thus ribes averaged 36.6 per acre.

The 1948 ribes eradication season extended from June 1 to September 10. Work was done out of four camps operated by the U. S. Forest Service, on the Gunflint, Isabella, Kawishiwi and Tofte Districts, and by local men on the Aurora and Mescha Districts. Labor in the camps consisted of high school boys, college students, some Indians from the Grand Portage Indian Reservation, and local men from nearby towns. Progress and quality of work done varied in direct proportion to the amount of immediate supervision provided, from very good at the Gunflint camp where the camp superintendent checked on his crews regularly, to very mediocre at the Sawbill Camp on the Tofte District, where duties other than Blister Rust Control took so much of the superintendent's time that he was unable to adequately keep in touch with the work for which the camp was established.

As shown in Text Table 5, both initial and rework was performed in 1948. A total of 3,481 acres of pine was given protection by the removal of 169,736 ribes from 4,630 acres of control area at a cost of 3,010 man-days.

Rust conditions are bad on the Superior National Forest and are rapidly getting worse. Numerous areas exist where the damage stage has been reached, and the existing white pines are too far gone to protect. The number of these areas, and the size of each area, are increasing each year. According to previous studies we may expect a disastrously high percent loss of young white pines in most of the unprotected stands by 1950.

Detailed work plans have been prepared and submitted for the 1949 eradication season. Work for the coming season is recommended on the Aurora, Gunflint, Isabella, Kawishiwi, LaCroix, Mesaba, and Tofte Districts. This schedule recommends the working of 6,492 acres of control area to give or maintain protection for 4,990 acres of pine at an estimated cost of 5,897 man-days.

Chippewa National Forest - Minnesota

The Chippewa National Forest is also a good white pine growing forest. The 13,062 acres of white pine listed in the control problem are made up of 11,317 acres of natural and 1,745 acres of planted white pine. White pine occurs on the Chippewa in association with red pine under which it grows well and eventually makes up the larger portion of the succeeding stand. In such situations ribes conditions are not bad. Most of the white pine plantings have been established in the Remer, Walker and Bena Districts in the southern part of the forest.

Of the 13,062 acres of white pine listed in the control areas, 10,710 acres have been initially worked and 8,150 acres have been placed on maintenance.

In 1948 to initially protect 131 acres of white pine 32,315 ribes were removed from 173 acres at a cost of 94 man-days. Second working was done on 242 acres from which 35,135 bushes were removed to protect 225 acres of pine at a cost of 288 man-days.

Initial work was done on the Cass Lake and Cut Foot Sioux Districts; second working on the Bena, Cut Foot Sioux, Remer and Walker Districts.

Results of checking after eradication on 302 acres worked showed 3.8 bushes with 8.7 F.L.S. per acre. There were 252 acres with averages of less than 25 F.L.S. per acre and 50 acres averaging between 25.1 and 50.0 F.L.S. per acre.

Although 1948 was not a favorable year for the spread of the rust, the effects of earlier spread, particularly in 1944, are just beginning to show up. Intensification of the rust has been noted in several unprotected stands and in those where rework is past due. The disease is found to be doing more serious damage to plantations than to natural stands. This is largely due to lack of screening. Furrowing and early release were mainly responsible for this condition and the trees have not closed in sufficiently to afford themselves protection from windborne spores. Pine infection is

particularly heavy in the southwestern part of the Forest, near Cass Lake and Walker. Ribes are generally more abundant in the southern part of the Forest. The period of rust intensification has definitely arrived on the Chippewa and only timely control measures can save the pine stands now threatened.

Control work on the Chippewa is not up to schedule. Several areas are in need of immediate rework if the benefits of earlier workings are to be saved. Increased allotments of funds for ribes eradication work are needed to bring the control program on the Forest up to date.

Work plans have been submitted listing areas recommended for initial and rework in six Districts. If at all possible these plans should be carried out in the 1949 eradication season and at least by the end of the fiscal year 1950. These recommendations include 1,588 acres to be worked initially and 1,896 acres of rework. To accomplish this program will require an estimated 2,150 man-days of labor.

Wayne National Forest - Ohio

According to records there are 520 acres of planted white pine on this forest in southern Ohio, of which 514 acres have been initially worked and are on maintenance. This forest is in southern Ohio where ribes are not abundant. Thus all but 6 acres of pine of the entire 520 acres is now on maintenance. White pine grows in excellent fashion in this part of the State due to proper soil conditions and long growing season. It is anticipated that practically no blister rust control problem will be involved in white pine plantings on the Wayne National Forest.

Hoosier National Forest - Indiana

A survey of white pine on the Hoosier was made in 1947. Only 18 acres of white pine were found to be worth protecting. The control area of 179 acres was found to be free of ribes and consequently the 18 acres of pine were placed on maintenance. This portion of Indiana, like southern Ohio is essentially ribes-free. White pine makes excellent growth in this part of the State and since there is practically no danger of infection by blister rust it is a very desirable species to include in the planting program.

Expenditures

Expenditures (3104 funds) by National Forests in Region 9 for blister rust control in 1948 are shown in Text Table 10 in the total amount of \$110,093.90. As shown in the table, the largest single item was spent in local control on the Superior National Forest. Not included in these costs are the activities on the forests of blister rust control personnel employed by the Bureau of Entomology and Plant Quarantine. These men assisted in training crews, checked, laid out work, and, in some cases, due to shortage of supervision, actually directed operations.

Recommendations for 1949

Specific recommendations are given in the 1948 blister rust control reports for each individual forest. Detailed work plans and budgets have been prepared cooperatively between representatives of the Forest Service and the Bureau of Entomology and Plant Quarantine. In planning work for the immediate future several factors must be carefully considered.

- (1) Rust is thoroughly established and intensifying so rapidly that in many cases a delay in ribes eradication of one to a few years will mean the loss of young white pine stands from blister rust.
- (2) In the selection of areas for working great care must be exercised to make sure that only those areas are worked in which the young pine values are the greatest and in most immediate danger of damage from blister rust.

In view of the large amount of work yet to be done in accomplishing control work, of the rapidity with which the rust is intensifying, it is inevitable that millions of young pines on thousands of acres will be killed by blister rust. This means a loss of many existing white pine stands. On many such areas white pine is the best crop. The removal of ribes from these areas should be performed in time to permit future or continued development of white pine forests.

Text Table 5. Local Control on National Forest Lands, by National Forest and Operating Agency, North Central Region, 1948

National Forest	Operating Agency	No. Areas	Acres White Pine Protected		Acres Control Area Worked	Ribes Bushes Destroyed	8-Hour Men-Days Used
			Natural	Planted			
			Initial Working				
			40	40			
Huron, Michigan	Forest Service	1			105	11	2
Manistee, Michigan	Forest Service	12	470	352	2,260	17,623	39
Marquette, Michigan	Forest Service	1	40	-	180	64	3
Hiawatha, Michigan	Bureau-State	3	112	160	885	39	8
	Forest Service	1	70	-	135	2,111	36
	Sub-total	4	182	150	1,020	2,150	18
Ottawa, Michigan	Bureau-State	2	85	-	355	1,094	29
	Forest Service	4	203	-	555	48,509	385
	Sub-total	6	288	-	910	49,603	414
Superior, Minn.	Forest Service	12	2,107	-	2,670	114,189	1,642
Chippewa, Minnesota	Forest Service	4	121	-	171	22,215	94
Chequamegon, Wisconsin	Forest Service	3	310	-	365	21,344	143
Nicolet, Wisconsin	Forest Service	1	343	27	545	12,585	140
All Forests	Bureau-State	5	197	160	1,240	1,133	31
	Forest Service	39	3,714	379	7,188	248,751	2,716
Total, Initial Working		44	3,911	539	8,428	249,884	2,747

Text Table 5. (Cont'd.) Local Control on National Forest Lands, by National Forest and Operating Agency.
North Central Region, 1948

National Forest	Operating Agency	No. Areas	Acres White Pine Protected			Acres Control Area Worked	Ribes Bushes Destroyed	8-Hour Man-Days Used
			Natural	Planted	Total			
			Second Working					
Manistee, Michigan	Forest Service	8	150	180	330	1,021	5,860	42
Marquette, Michigan	Forest Service	1	95	"	95	200	7,054	132
Hiawatha, Michigan	Bureau-State	2	200	-	200	755	194	3
	Forest Service	3	565	-	565	1,330	7,035	97
	Sub-total	5	765	"	765	2,085	7,229	130
Ottawa, Michigan	Forest Service	1	55	-	55	155	770	40
Superior, Minnesota	Forest Service	4	511	140	651	834	29,927	533
Chippewa, Minnesota	Forest Service	7	98	127	225	242	35,125	209
Chequamegon, Wisconsin	Forest Service	11	3,005	360	3,365	5,951	84,940	1,601
Nicolet, Wisconsin	Forest Service	1	-	200	200	350	6,368	164
All Forests	Bureau-State	2	200	-	200	755	194	3
	Forest Service	36	4,479	1,007	5,486	10,083	177,089	2,984
Total, Second Working			4,679	1,007	5,686	10,838	177,283	2,987

Text Table 5. (Cont'd.) Local Control on National Forest Lands, by National Forest and Operating Agency,
North Central Region, 1948

National Forest	Operating Agency	No. Areas	Acres White Pine Protected		Acres Control Area Worked	Ribes Bushes Destroyed	6-Hour Man-Days Used
			Natural	Planted			
Third and Other Workings							
Manistee, Michigan	Bureau-State	1	35	-	120	64	1
	Forest Service	2	30	278	534	336	10
	Sub-total	3	65	278	654	400	11
Marquette, Michigan	Bureau-State	1	-	300	520	71	1
	Forest Service	1	60	-	120	2,781	73
	Sub-total	2	60	300	640	2,852	74
Hiawatha, Michigan	Bureau-State	1	135	-	520	53	1
	Forest Service	1	500	-	800	2,273	55
	Sub-total	2	635	-	1,320	2,326	56
Ottawa, Michigan	Forest Service	3	-	925	1,711	21,914	434
Superior, Minnesota	Forest Service	3	42	681	926	25,620	631
Chequamegon, Wisconsin Region	Forest Service	2	80	215	365	2,641	54
	Bureau-State	3	170	300	1,160	188	3
	Forest Service	17	712	2,099	4,456	55,565	1,257
Total, Third and Other Workings		20	882	2,399	5,616	55,753	1,260

Text Table 5. (Cont'd.) Local Control on National Forest Lands, by National Forest and Operating Agency,
North Central Region, 1948

National Forest	Operating Agency	No. Areas	Acres White Pine Protected		Acres Control Area Worked	Ribes Bushes Destroyed	8-Hour Man-Days Used
			Natural	Planted			
All Workings							
Huron, Michigan	Forest Service	1	40	-	105	11	2
Manistee, Michigan	Bureau-State	1	35	-	120	64	1
	Forest Service	22	650	810	3,815	23,819	119
Sub-total		23	685	810	3,935	23,883	120
Marquette, Michigan	Bureau-State	1	-	300	520	71	1
	Forest Service	3	195	-	500	9,899	210
Sub-total		4	195	300	1,020	9,970	211
Hiawatha, Michigan	Bureau-State	6	447	160	2,160	286	6
	Forest Service	5	1,135	-	2,265	11,419	188
Sub-total		11	1,582	160	4,425	11,705	194
Sault Ste. Marie, Michigan	Bureau-State	2	85	-	355	1,094	29
	Forest Service	8	258	925	2,421	71,193	859
Sub-total		10	343	925	2,776	72,287	888
Superior, Minnesota	Forest Service	24	2,660	821	4,630	169,736	3,010
Chippewa, Minnesota	Forest Service	11	229	127	415	67,450	382
Chequamegon, Wisconsin	Forest Service	16	3,395	575	6,681	108,925	1,863
Mioolet, Wisconsin	Forest Service	2	343	227	895	18,953	304
All Forests	Bureau-State	10	567	460	3,155	1,515	37
	Forest Service	92	8,905	3,485	21,727	481,405	6,957
Total, All Workings		102	9,472	3,945	24,882	482,920	6,994

Text Table 6. Results of Checking After Ribes Eradication on National Forests,
North Central Region, 1948

National Forest	No. Areas	Acres Worked and Checked	Checking After Eradication				Classification of Worked Areas on Basis of Ribes F.L.S. per Acre Left After Working				Percentage Acres With FLS or Less
			Strip Acres	Ribes Found		Ribes per Acre Bushes	F.L.S.	F.L.S. (Acres)	15.1 to 25.0 FLS (Acres)	Over 25 FLS (Acres)	
				Bushes	F.L.S.						
Huron, Mich.	1	105	10.50	0	0	0	0	105	-	-	100.0
Manistee, Mich.	23	3,935	82.50	80	173.5	1.0	2.1	3,645	290	-	100.0
Marquette, Mich.	4	1,020	19.60	56	72.0	2.9	3.7	1,020	-	-	100.0
Hiawatha, Mich.	11	4,425	59.30	52	65.0	0.9	1.1	4,425	-	-	100.0
Ottawa, Mich.	10	2,776	49.00	66	147.0	1.3	3.0	2,776	-	-	100.0
Superior, Minn.	19	4,250	95.17	162	527.8	1.7	5.5	3,925	52	273	93.6
Chippewa, Minn.	8	302	14.62	55	126.5	3.8	8.7	184	68	50	83.4
Chequamegon, Wis.	16	6,681	159.90	328	964.9	2.1	6.0	6,681	-	-	100.0
Nicolet, Wis.	2	895	15.30	66	70.2	4.3	5.1	895	-	-	100.0
Region Total	94	24,389	505.89	865	2,154.9	1.7	4.3	23,656	410	923	98.7

Text Table 7. Status of Control on National Forests, North Central Region,
on December 31, 1948 Not Acres

National Forest	Total Control Problem, Acres				Acres Initially Worked				Acres Not Initially Worked				Acres On Maintenance		Percent	
	Natural Planted		Total Control		Natural Planted		Total Control		Natural Planted		Total Control		Natural Planted		Total Control	
	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.
Hoosier	-	18	18	179	-	18	18	179	-	6	312	18	179	100.0	100.0	
Wayne	-	520	520	4,341	-	514	514	4,029	6	312	514	4,029	98.8	98.8		
Huron	422	1,001	1,423	5,678	407	1,001	1,408	5,648	15	30	939	4,241	98.9	66.0		
Manistee	2,344	20,007	22,351	69,255	2,344	19,997	22,341	69,190	10	65	21,536	67,045	100.0	95.4		
Marquette	6,342	4,981	11,323	25,083	6,342	4,981	11,323	25,083	-	-	4,387	11,485	100.0	38.7		
Hiawatha	8,933	2,729	11,662	32,929	8,615	2,729	11,344	31,809	318	1,120	5,064	16,005	97.3	43.4		
Ottawa	7,875	4,036	11,911	23,343	7,610	3,865	11,475	22,083	436	1,260	3,593	7,160	96.3	30.2		
Superior	81,222	3,943	85,165	135,008	24,534	3,943	28,477	39,076	56,688	95,932	1,979	2,350	33.4	2.3		
Chippewa	11,317	1,745	13,062	26,406	8,965	1,745	10,710	21,581	2,352	4,825	8,150	15,255	82.0	62.4		
Chequamegon	15,725	4,732	20,457	41,370	14,686	4,395	19,081	33,714	1,376	7,656	7,394	13,481	93.3	36.1		
Nicolet	5,883	6,393	12,276	24,174	5,788	6,393	12,181	23,889	95	285	4,202	8,925	99.2	34.2		
Region Total	140,063	50,105	190,168	387,766	79,291	49,581	128,872	276,281	61,296	111,485	57,776	150,955	67.2	30.4		

Text Table 8. Summary of Local Control Performed on National Forests, North Central Region,
 from Inception to December 31, 1948. All Agencies Cross Acres

National Forest	Gross Acres W. P. Protected	Gross Acres Worked	Number of Ribes Destroyed	Total Man-Days Used	Average per Acre	
					Ribes	Man-Days
			Initial Working			
Shawnee, Illinois	1	50	0	0	0.0	0.00
Hoosier, Indiana	18	179	0	3	0.0	0.02
Wayne, Ohio	514	4,029	56	13	Trace	0.01
Huron, Michigan	1,632	6,466	64,486	514	10.0	0.08
Manistee, Michigan	22,011	69,192	172,527	1,445	2.5	0.02
Marquette, Michigan	10,875	26,937	848,153	7,304	31.5	0.27
Hewatha, Michigan	9,901	30,931	679,546	5,450	22.0	0.18
Ottawa, Michigan	14,255	29,080	4,235,956	16,555	145.7	0.57
Superior, Minnesota	27,555	44,641	6,204,026	27,999	139.0	0.63
Chippewa, Minnesota	14,557	36,896	3,153,843	13,955	85.5	0.38
Chequamegon, Wisconsin	16,679	39,475	2,651,699	16,648	67.2	0.42
Nicolet, Wisconsin	12,472	29,433	2,282,406	14,303	77.5	0.49
Total, Initial Working	136,470	317,309	20,292,698	104,189	64.0	0.33
			Second Working			
Huron, Michigan	497	1,628	26,439	154	16.2	0.09
Manistee, Michigan	4,620	14,734	16,378	206	1.1	0.01
Marquette, Michigan	5,247	11,945	123,773	2,435	10.4	0.20
Hewatha, Michigan	6,341	15,681	112,529	1,659	7.2	0.11
Ottawa, Michigan	9,413	17,322	808,668	5,983	46.7	0.34
Superior, Minnesota	11,610	16,132	1,144,161	9,025	70.9	0.56
Chippewa, Minnesota	4,777	10,047	306,664	2,652	30.5	0.26
Chequamegon, Wisconsin	16,283	28,392	669,267	8,352	23.6	0.29
Nicolet, Wisconsin	9,931	18,701	351,966	4,338	18.8	0.23
Total, Second Working	68,719	134,582	3,559,845	34,804	26.5	0.26

Text Table 8. (Cont'd.) Summary of Local Control Performed on National Forests, North Central Region, from Inception to December 31, 1948, All Agencies Gross Acres

National Forest	Gross Acres W. P. Protected	Gross Acres Worked	Number of Ribes Destroyed	Total Man-Days Used	Average per Acre Worked	
					Ribes	Man-Days
<u>Third and Other Workings</u>						
Huron, Michigan	8	128	464	5	3.6	0.04
Manistee, Michigan	1,653	5,458	7,500	91	1.4	0.02
Marquette, Michigan	820	1,790	6,523	184	3.6	0.11
Hiawatha, Michigan	1,582	3,590	13,463	279	3.6	0.08
Ottawa, Michigan	4,043	7,170	120,911	2,083	16.9	0.29
Superior, Minnesota	4,786	8,868	276,316	3,219	31.2	0.36
Chippewa, Minnesota	1,628	2,135	82,034	412	38.4	0.19
Chequamegon, Wisconsin	1,739	2,484	36,457	878	14.7	0.35
Nicolet, Wisconsin	894	1,660	34,982	719	21.1	0.43
Total, Third and Other Workings	17,153	33,283	578,650	7,870	17.4	0.24
<u>All Workings</u>						
Shawnee, Illinois	1	50	0	0	0.0	0.00
Hecolier, Indiana	18	179	0	3	0.0	0.02
Wayne, Ohio	514	4,029	56	13	Trace	0.01
Huron, Michigan	2,137	8,222	91,389	673	11.1	0.08
Manistee, Michigan	28,284	89,384	196,405	1,742	2.2	0.02
Marquette, Michigan	16,942	40,672	978,449	9,923	24.1	0.24
Hiawatha, Michigan	17,824	50,202	805,538	7,388	16.0	0.15
Ottawa, Michigan	27,711	53,572	5,165,535	24,621	96.4	0.46
Superior, Minnesota	43,951	69,641	7,624,503	40,243	109.5	0.58
Chippewa, Minnesota	20,962	49,078	3,542,541	17,019	72.2	0.35
Chequamegon, Wisconsin	34,701	70,351	3,357,423	25,878	47.7	0.37
Nicolet, Wisconsin	23,297	49,794	2,669,354	19,360	53.6	0.39
Total, All Workings	216,342	485,174	24,431,193	146,863	50.4	0.30

Text Table 9. Summary of Ribes Eradication, All Workings, by National Forests and Operating Agencies, North Central Region, from Inception to December 31, 1948 Gross Acres

National Forest	Operating Agency	Gross Acres Worked	Ribes Destroyed	Man-Days Used	Per Acre	
					Ribes	Man-Days
Shawnee, Ill.	Bureau-State	50	0	0	0.0	0.00
Ecosier, Ind.	Bureau-State	179	0	3	0.0	0.02
Wayne, Ohio	Bureau-State	4,029	56	13	Trace	0.01
Huron, Mich.	Bureau-State	2,625	106	18	Trace	0.01
	Forest Service	5,597	91,283	655	16.3	0.12
	Total	8,222	91,389	673	11.1	0.08
Manistee, Mich.	Bureau-State	56,320	36,895	698	0.7	0.01
	Bureau-Interm.	365	1,586	19	4.3	0.05
	Forest Service	32,699	157,924	1,025	4.8	0.03
Marquette, Mich.	Total	89,384	196,405	1,742	2.2	0.02
	Bureau-State	4,045	203,236	1,085	50.2	0.27
	Forest Service	36,627	775,213	8,838	21.2	0.24
Miyavaka, Mich.	Total	40,672	978,449	9,923	24.1	0.24
	Bureau-State	5,925	229,992	754	38.8	0.13
	Forest Service	44,277	575,546	6,634	13.0	0.15
Ottawa, Mich.	Total	50,202	805,538	7,388	16.0	0.15
	Bureau-State	3,735	353,341	1,171	94.6	0.31
	Bureau-Interm.	1,173	83,810	414	71.4	0.35
Superior, Minn.	Forest Service	48,664	4,728,384	23,036	97.2	0.47
	Total	53,572	5,165,535	24,621	96.4	0.46
Soochow, Minn.	Bureau-State	6,507	1,479,097	4,518	227.3	0.69
	Forest Service	63,134	6,145,406	35,725	97.3	0.57
	Total	69,641	7,624,503	40,243	109.5	0.58
Wauquago, Wis.	Bureau-State	14,348	936,406	2,607	65.3	0.18
	Forest Service	34,730	2,606,135	14,412	75.0	0.41
	Total	49,078	3,542,541	17,019	72.2	0.35
Wauquago, Wis.	Bureau-State	11,277	247,261	1,252	21.9	0.11
	Bureau-Interm.	8,853	161,999	2,180	18.3	0.25
	Forest Service	50,221	2,948,163	22,446	58.7	0.45
Wauquago, Wis.	Total	70,351	3,357,423	25,878	47.7	0.37
	Bureau-State	8,279	256,292	1,742	31.0	0.21
	Bureau-Interm.	873	7,427	147	8.5	0.17
Wauquago, Wis.	Forest Service	40,642	2,405,635	17,471	59.2	0.43
	Total	49,794	2,669,354	19,360	53.6	0.39
Region	Bureau-State	117,319	3,742,682	13,861	31.9	0.12
	Bureau-Interm.	11,264	254,822	2,760	22.6	0.25
	Forest Service	356,591	20,433,689	130,242	57.3	0.37
Region Total		485,174	24,431,193	146,863	50.4	0.30

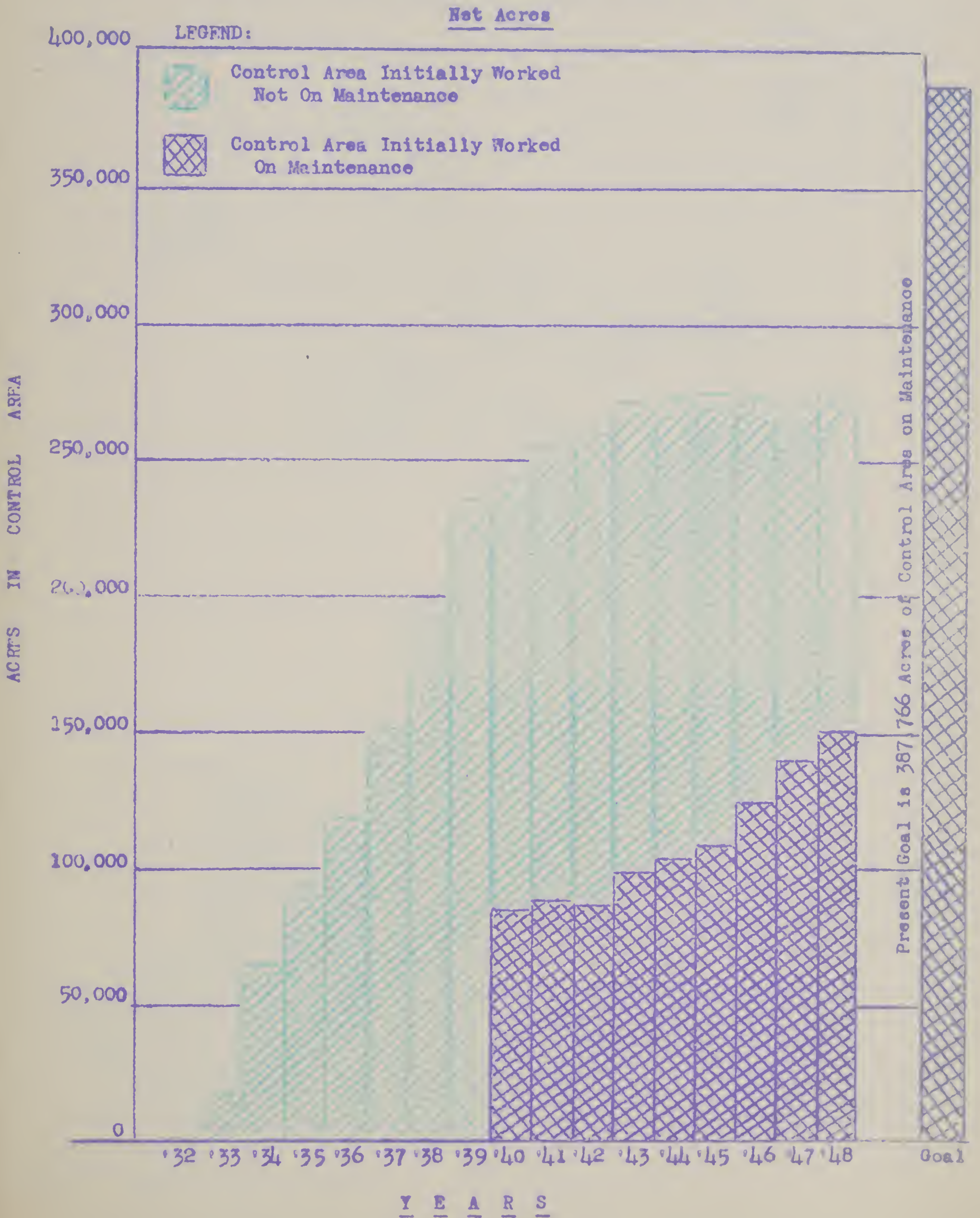
Text Table 10. Forest Service (3104 and 74) Funds Spent on Blister Rust Control
North Central Region, Calendar Year 1948

National Forest	Forest Service Regular Funds
Huron, Michigan	\$ 11.06
Manistee, Michigan	2,146.68
Marquette, Michigan	1,940.19
Hiawatha, Michigan	1,563.10
Ottawa, Michigan	11,436.05
Superior, Minnesota	61,100.82
Chippewa, Minnesota	11,370.40
Chequamegon, Wisconsin	16,856.62
Nicolet, Wisconsin	3,668.98
Region Total	\$110,093.90

C H A R T 9

STATUS OF CONTROL AT END OF EACH YEAR AS SHOWN

FOREST SERVICE LANDS - NORTH CENTRAL REGION



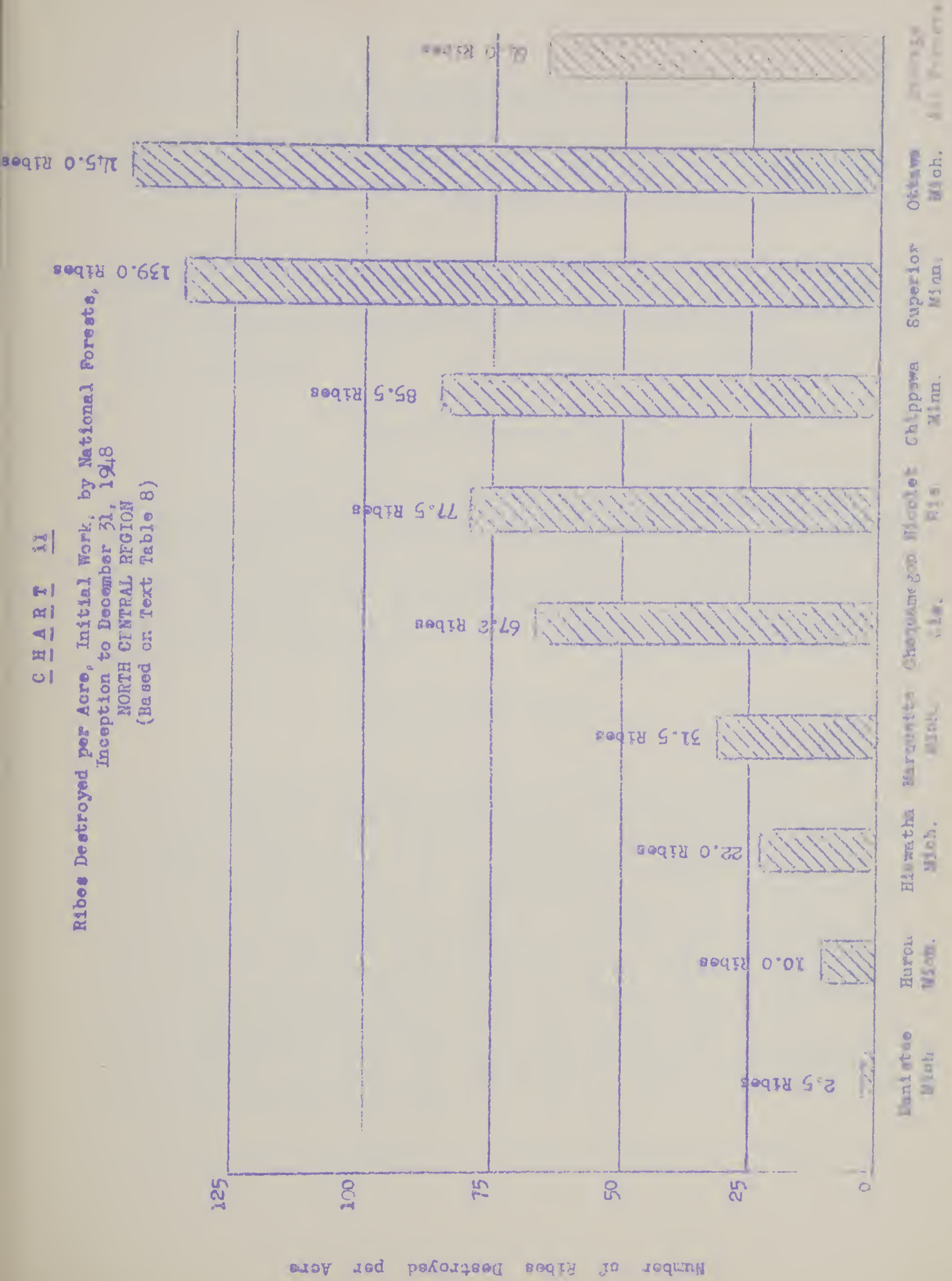


Map of the United States showing the distribution of forest land in 1971.



CHART II

Ribes Destroyed per Acre, Initial Work, by National Forests,
Inception to December 31, 1948
NORTH CENTRAL REGION
(Based on Text Table 8)



BLISTER RUST CONTROL ON INDIAN RESERVATIONS, 1948

NORTH CENTRAL REGION FINANCIAL PROJECT BLR-7

Objective

The objective of the blister rust control program on Indian Reservations is to protect against blister rust all valuable white pine stands administered by the Indian Service. This involves initial and subsequent eradication of ribes from within infecting distances of white pine stands in order to bring such stands through to commercial maturity free from blister rust damage.

Memorandum of Understanding

Control work on Indian Reservation lands is performed through a Memorandum of Understanding between the U. S. Indian Service and the Bureau of Entomology and Plant Quarantine. The Indian Service is responsible for selecting the pine areas to be protected and the employment of labor and supervision. The Bureau of Entomology and Plant Quarantine is responsible for the preparing of work plans and maps, keeping records, making reports of work accomplished, training of labor and supervision, and checking the adequacy of the control work.

Protective Zone Widths

The control of white pine blister rust involves the removal of currant and gooseberry bushes, the alternate hosts, from within the pine stand and from the immediate surrounding area. In this report, currant and gooseberry bushes will be hereafter referred to as "ribes". Under most conditions a protective zone width of 900 feet is considered adequate. During recent years, studies have indicated that it is not necessary under certain conditions to maintain a full 900 foot protective zone width. Due to the effect of screening by vegetation, zone widths have been reduced in swamps and woods depending on the density of forest cover. The protective zone widths have now been reduced to approximately 50 feet in swamps, 300 feet in dense woods, 600 feet in open woods, but retaining the full 900 feet in open fields or meadow types. The screening effect of dense swamp growth hinders the dissemination of sporidia from infected ribes in the swamp to the pines in the upland. The movement of spores from swamps is further reduced by the fact that most swamps are heavily shaded and cool, thus hindering the formation of rising air currents.

By reducing these zone widths the cost of eradication is considerably lessened. Ordinarily, one crew width along the edge of a swamp will be adequate to prevent heavy infection of the adjoining pine stand. These reductions in zone widths may not give complete protection but will provide sufficient protection to bring a fully-stocked stand of pine through to commercial maturity.

Rust Conditions

General Status for 1948

Weather conditions in 1948 were unfavorable for the spread of the rust. The season was characterized by an unusually dry spring, a hot dry summer and a very dry fall. In consequence rust on ribes was found to be less intense on the Indian Reservations this year than it has been for several previous years when the wet cycle prevailed. However, intensification of the disease on pine in unprotected areas continued to be noted, as much of the infection which had occurred earlier, particularly in 1944, is just becoming evident. This is especially true in the northern parts of the three Lake States.

Blister rust has been found on white pine and on ribes in all of the reservations except the Sac-Fox in Iowa. The earliest infection on Indian Reservations was found on the Menominee in Wisconsin in 1918. Rust on both ribes and white pines was found for the first time on the Lac du Flambeau in Wisconsin in 1946. Fortunately, ribes eradication was started in time and has continued on a sufficiently adequate basis to save large areas of white pine on all the Indian Reservations from excessive loss due to blister rust.

Significance of Present Rust Conditions

In order to better understand the significance of a small amount of pine infection in an unprotected stand three periods of development are recognized as follows: (1) Introductory Period; (2) Period of Intensification; and (3) Period of Climax. These periods are discussed in the 1946 report.

Control Accomplishment in 1948

Initial or rework in 1948 was performed on 8 of the 11 Reservations, or on all but the Sac-Fox, Leech Lake, and Vermilion Reservations. As noted in Text Table 11, there were 11,943 acres of control area cleared initially of 172,776 ribes to protect 7,096 acres of pine at a cost of 1,944 man-days. As second working 2,250 acres of white pine were protected by the removal of 496,719 ribes from 4,323 acres of control area at a cost of 2,576 man-days. In third working 4,471 acres of white pine were given protection by the removal of 1,065,190 ribes from 7,171 acres of control area at a cost of 5,122 man-days. In all workings 1,734,685 ribes were removed from 23,437 acres of control area to protect 13,817 acres of white pine at a cost of 9,642 man-days. The abundance of ribes by reservations is shown graphically in Chart 8 based on total work done to date.

All of this control work was performed on the basis of plans agreed upon by the Indian Service and the Blister Rust Control Organization. Indian labor was used entirely. As in each of the years since 1943 Indian women as well as men made up a proportion of the Indian eradication crews. Indian men and women were used as crew foremen, and in general, the direct supervision of the work was handled by Indians. The Bureau of Entomology and Plant Quarantine provided technical direction and training to field men, made or revised necessary maps, checked the adequacy of control work, kept records of work done, and prepared the necessary reports.

In the selection of areas to be worked in 1948, care was taken to make sure that the utmost in terms of pine protected would be obtained from labor expended. Those stands of young white pine of most value and in which the rust was intensifying at the most rapid rate were worked.

Checking

In Text Table 12, results of checking after eradication in 1948 are shown. All work performed on Reservations in Wisconsin was given a formal check and all except a few areas worked late in the season on the Menominee met the standard of quality required. In Minnesota not all of the worked acreage was formally checked but all of it was given an administrative check as the work progressed. On several areas on the Reservations in Minnesota chemical eradication of ribes was tried by cutting off the bushes and treating the stumps with 2, 4-D. On such areas a formal check was not feasible and will have to be postponed until next spring after the treated bushes can be checked for sprouts.

General Status of Control

In Text Table 13, the status of blister rust control on Indian Reservations on December 31, 1948 is shown. The total white pine on Indian Reservations in the Region listed for protection amounts to 72,296 acres, an increase of some 10,000 acres over the 1947 figure. This increase is due to natural white pine regeneration which has been taking place on several of the Reservations in the last few years. Surveys made in 1948 included this new acreage which had not been mapped previously. Of the 72,296 acres of pine, 67,716 acres or 93 per cent have been initially protected, and 34,917 acres or 48 per cent are now on maintenance. It will be noted in Text Table 13, that initial work has been completed on the Sac-Fox Reservation in Iowa and on all the Reservations in Minnesota with the exception of 20 acres on the Nett Lake and that only a relatively small acreage remains to be initially worked on those in Wisconsin. The major problem remaining involves rework.

In general, ribes are more abundant on all Indian Reservation lands than the average. The fact that such a high proportion of Indian white pine forests has been initially worked, and the absence of serious damage to white pines from blister rust, speak very well for the effective manner in which the Indian Service has performed blister rust control.

A distinction should be emphasized between "Net" acres worked and "Gross" acres worked. In Table 13 it is shown that the "Net" acres initially worked is 114,348. In Table 14 there are reported 121,831 "Gross" acres initially worked. "Gross" acres are simply the accumulation of acres worked each year. "Net" acres represent our best knowledge of acres worked and retained in the control problem. The difference between "Gross" and "Net" (7,483 acres) represents acres thrown out of control problem because sufficient pine values no longer exist, due to fire, logging, grazing, etc.

Status of Control by Reservations

NOTE: See 1943 Report for individual Reservation maps.

Sac-Fox Indian Reservation - Iowa

The Sac-Fox Indian Reservation located approximately in the center of the state of Iowa has 45 acres of planted pine with a control area of 500 acres. Ten acres with a control area of 206 acres were initially worked in 1934. In 1944 the remaining 35 acres were initially worked, and the 10 acres given a second working by removing 14,074 ribes from 500 acres of control zone at a cost of 168 man-days. Incidentally, white pine is making excellent growth on this Reservation. Annual height growths of from three to four feet are not uncommon. Excellent white pine planting sites relatively free from ribes are present on the Reservation. No work has been done since 1944.

No blister rust infection has been found on the reservation. Ribes infection, however, has been located in Tama County.

Grand Portage Indian Reservation - Minnesota

The Grand Portage Reservation has 974 acres of white pine in the control problem involving 1,271 acres of control area. All of this acreage has been worked initially but none of it is on maintenance. Ribes are very numerous, averaging 1,279 per acre on all workings, which exceeds by far the ribes content found on any of the other reservations in this Region. Rework therefore is the recurring item of the control problem on this reservation. During 1948 ribes eradication crews did rework on 560 acres and pulled 159,500 ribes at a cost of 833 man-days. Rust on white pine is generally distributed over the Reservation. Heavy pine infection occurs in unprotected stands which do not have sufficient pine stocking to be included in the control program. Only occasional cankers are found in protected stands where ribes eradication has been thorough and timely enough to forestall serious loss. Control work on this reservation is being kept on schedule.

Nett Lake Indian Reservation - Minnesota

There are approximately 5,252 acres of white pine, all but 142 acres natural, included in the control area of 7,136 acres. Most of this acreage lies in one large block south of Nett Lake. Of this total, 5,232 acres or all but 20 acres have been initially protected and 3,674 acres or 70 per cent are on maintenance.

Blister rust on ribes is general over the Reservation. Pine infection was found for the first time in 1942. Approximately 10 percent of the white pine in an unprotected plantation, established in 1937 and 1938, was found to be infected in 1942. In 1945 scouting showed the rust to be widely distributed on unprotected areas with cankers of recent origin. Fortunately, the main body of the white pine has been protected initially, and it is believed that there will be no serious loss from the rust if this protected condition can be maintained.

During 1948, rework, (second, third and fourth workings) was done on 1,421 acres at a cost of 1,181 man-days to pull 150,300 ribes. Both Indian men and women were used and effective eradication work was accomplished. In general, prompt and effective control work has prevented serious loss from blister rust on this reservation.

Vermilion Indian Reservation - Minnesota

There are 78 acres of natural white pine with a control area of 186 acres on the Reservation. All of this was initially worked in 1933 and again in 1937, 1943 and 1946. Logging operations during the war years necessitated the fourth working. No work was done in 1948.

While ribes infection is general in this locality, pine infection was found for the first time near the western edge of the pine area in 1943. It is expected, however, that eradication has been sufficiently timely to prevent serious loss. Logging performed in 1944 has disturbed conditions and stimulated white pine reproduction and ribes growth.

White Earth Indian Reservation - Minnesota

There are 481 acres of natural white pine on this Reservation, all of which have been initially protected and a considerable portion of it reworked. After 1948 workings, 231 acres of white pine or nearly half of it, have been placed on maintenance. Pine infection was found for the first time in 1941. There has been no significant increase in pine infection on protected areas since 1941.

Rework of 486 acres requiring 345 man-days to remove 156,657 ribes was done in 1948. This work brought up to date the program on the White Earth Indian Reservation.

Leech Lake (Onigum Unit) - Minnesota

The Onigum Unit is entirely within the boundaries of the Chippewa National Forest. The Indian Service, through purchase and land exchange, has increased tribal ownership in the past few years. Initial ribes eradication was performed jointly in 1934 by men employed by the Bureau of Entomology and Plant Quarantine, the Forest Service and the Indian Service. Records of this work were kept with Forest Service records until 1946, when they were transferred to the Indian Service.

There are now 2,432 acres of natural white pine with a control area of 3,387 acres. This has all been initially worked, and 2,076 acres of white pine or 85 percent is on maintenance.

Ribes infection was first found in 1934, and one infected pine found in 1939. Subsequent search for pine infection has shown it to be light. Early ribes eradication efforts were valuable in preventing the rust from building up and doing damage.

Work is completed on this reservation for the present. No work was done in 1948.

Red Lake Indian Reservation - Minnesota

This Reservation contains the largest amount of white pine of all the reservations located in Minnesota. There are 12,473 acres of white pine listed as worth protecting all of which have been given initial protection. Over half of the pine acreage, 6,757 acres, are shown as being on maintenance.

The main body of white pine lies on the peninsula projecting between Upper and Lower Red Lake. A considerable number of smaller areas, many of which are on a maintenance basis, are found immediately south of Lower Red Lake. Blister rust was first reported on both pine and ribes in the summer of 1933. Fortunately, initial local control work was performed that year and in subsequent years, thus forestalling damage to white pines which would have occurred had they not been protected in time.

In 1948 protection was maintained for 2,459 acres of natural and planted pine by removing 708,207 ribes from 4,940 acres of control area at a cost of 2,635 man-days. All of this was rework which included second, third and fourth workings. Logging in 1944 and 1945 was found to have disturbed ecological conditions to such an extent that considerable ribes regeneration had taken place on previously worked areas on Ponemah Point. This condition slowed down the crews and it was not possible to complete the scheduled work on the "Point" in 1948. Chemical eradication was tried to a limited extent on the Red Lake by treating cut off ribes with a 2, 4-D solution. It was discontinued, however, when Supervisor Kelley discovered sprouting from the treated bushes and he directed his crews to resume uprooting the ribes instead of treating them. Since it was not possible to detect all treated ribes at the time a check of the work was made, much of the formal checking had to be postponed until the spring of 1949. However, administrative checks were made as the work progressed and the Indian crews were found to be doing good work.

Plans for 1949 include maintaining protection on 2,016 acres of pine on Ponemah Point and at Lower Red Lake. This will require working 2,896 acres of control area at an estimated cost of 3,465 man-days. All of this will be rework. Surveys now in progress indicate that an additional 200 acres of white pine will be brought into the control program. This will require the initial working of 300 acres of control area at an estimated cost of 300 man-days.

Bad River Indian Reservation - Wisconsin

There are 8,290 acres of natural white pine listed for protection involving 15,294 acres of control area. Of this total control area 13,704 acres have been initially worked, leaving 1,590 acres on which initial work is needed. After 1948 workings, 5,676 acres of white pine, or 68 percent, were placed on maintenance.

Scattered pine infection has been found on the reservation. Most of it is of recent origin, since 1938. An analysis of cankers found indicates that pine infection is increasing very rapidly on unprotected areas. Ribes concentrations are heavy. Only an occasional canker has been found on protected pines.

Ribes eradication got off to a good start in 1948. An average of 11 Indian men worked daily, starting on April 29 and continuing until September 29.

A total of 887 acres of white pine were protected initially by the eradication of 11,719 ribes from 1,442 acres of control area with 118 man-days of labor. Second eradication amounted to 227 acres of white pine protected by the removal of 94,256 ribes from 408 acres of control area with 520 man-days used. Third eradication was done on 543 acres of control area, protecting 231 acres of pine by the removal of 87,933 ribes with 545 man-days used. The total of all eradications amounted to 1,395 acres of white pine protected by eradication of 193,958 ribes from 2,393 acres of control area at a cost of 1,183 man-days.

All eradication work was checked while in progress by the Supervisor and the District Leader. The ribes live stem remaining after eradication was well below the allowable maximum of 25 feet per acre.

The proposed control work for the calendar year 1949 on the Bad River Reservation consists entirely of rework on 962 acres of control area to protect 593 acres of white pine. This work will require an estimated 790 man-days of labor and four months of supervision.

Lac Court Oreilles Indian Reservation - Wisconsin

On this reservation there are 12,600 acres of pine, involving 24,000 acres of control area. This substantial increase of 4,670 acres of pine over what was reported in 1947 is due to expansion of areas of white pine through natural reproduction. By the end of 1948, 11,389 acres of white pine with 20,136 acres of control area had been initially worked, and 3,272 acres of pine with 6,484 acres of control area were on maintenance. There remain 1,211 acres of white pine to be initially protected, and 3,864 acres of white pine to be reworked.

During 1948 there were 1,868 acres worked initially and 1,496 given reworking. In all workings, to initiate or maintain protection on 2,033 acres of white pine, 220,005 ribes were removed from 3,364 acres of control area at a cost of 1,282 man-days. Control work started on April 29 with an average of 13 men. Work terminated on September 24. All men employed were experienced blister rust control workers and they did good work.

All areas worked were systematically checked in progress by the BRC Supervisor and District Agent. The ribes live stem remaining after eradication was found to be well below the allowable maximum of 25 feet per acre.

In 1944, rust on both ribes and pines was found quite generally distributed, and causing some damage to young pines in unprotected areas. Two infected trees were found on an area initially protected. However, these trees had cankers 10 years old, which would indicate they were formed prior to ribes eradication in 1938. In 1945 an unprotected area of white pine in pole and reproduction sizes in Sec. 3, T. 40N. R. 8W, was found with a high percentage of reproduction affected with blister rust, and many pines dead. Some of the areas worked initially in 1946 showed quite heavy infection on the young pines, while those areas previously worked showed negligible damage. Subsequent surveys showed rust quite generally distributed, with damage negligible on areas previously protected.

In view of increased acreages of young pine found since 1943 and the fact that rust is now present and intensifying at a rapid rate, an enlarged control program is recommended for the coming field season, in order to prevent as much loss as possible. As part of the 5 year program plans call for the working of 3,342 acres, both initial and rework, using an estimated 1,160 man-days.

Lac du Flambeau Indian Reservation - Wisconsin

As a result of comprehensive surveys in the winters of recent years new white pine areas were discovered, chiefly of natural reproduction coming in since 1937. This greatly increased the control problem from 2,094 acres of white pine with 6,579 acres of control area in 1945 to 10,858 acres of white pine with 20,257 acres of control area in 1948. By the end of 1948, there were 9,692 acres of white pine initially protected, and 7,563 acres on maintenance. This leaves 1,166 acres of white pine to be initially protected, and 2,127 acres needing rework.

During 1948 there were 3,142 acres of white pine given initial protection. To accomplish this protection 62,952 ribes were removed from 5,563 acres of control area costing 547 man-days. Ribes eradication work started April 23, 1948 and continued steadily until September 17th using a crew of five men.

All areas worked were systematically checked by the BRC Supervisor and the District Leader and found to pass the Regional standards of quality very well.

Pine infection was found for the first time in 1946. Damage is fairly severe in a few small unprotected areas near the northwest corner of the Reservation. Elsewhere infection is light and scattered.

The proposed control program for the calendar year 1949 recommends the working of 3,368 acres of control area at an estimated cost of 375 man-days. If followed, all remaining known unprotected white pine (1,166 acres) in the control program will be protected initially during the year, and an additional 795 acres will receive continued protection by rework.

Menominee Indian Reservation - Wisconsin

The Menominee Indian Reservation contains the largest amount of white pine of all the reservations in this Region. There are approximately 18,813 acres of white pine, nearly all natural, listed for protection involving 32,277 acres of control area. Of this total pine acreage, 17,030 acres, or 90 percent, have been given initial protection. The remaining 1,783 acres of white pine not

initially worked are largely mature white pine not scheduled for working until after logging. Owing to the general abundance of ribes, only 5,668 acres of white pine have been placed on maintenance. The acreage increase, resulting from natural seeding in, continues to exceed the annual cut and losses from fire. The forest is under a sound, long-time management plan.

A large-scale ribes eradication program was performed in 1948, including both initial and reeradication work. Under initial working, 1,942 acres of white pine were protected by removing 66,784 ribes from 3,070 acres of control area at a cost of 960 man-days. Under rework, 915 acres of pine were protected by removing 16,322 ribes from 1,640 acres of control area at a cost of 676 man-days. The areas worked in 1948 were selected by the Indian Service in close cooperation with the Blister Rust Control Organization, and as part of a long time plan, in order that most returns in terms of young pine protected would result from labor expended.

Ribes eradication work in 1948 extended from May 3 to September 10. An average of about 30 persons were employed consisting of both young Indian men and women. Toward the latter part of the season only the three women crews were operating, the men having quit because they lost interest or were released because of unsatisfactory work. The control program on the Reservation was administered by Forest Supervisor John Libby in close cooperation with the Wisconsin District Leader, Walter Ridlington, Indian Service Junior Forester supervised the work in the field.

Systematic checking and general observation revealed that the quality of work done was only fair. Some areas had to be reworked before they could meet the standard of quality required and a few will have to be mopped up next spring because too many bushes were missed late in the season.

The Menominee Indian Reservation represents an excellent example of the value of timely and adequate ribes eradication throughout the past years. Pine infection was found on this Reservation as early as 1918. Ribes are abundant and grow in close association with white pines. Weather conditions are favorable for the rust. The stage was set for a wholesale destruction of young white pine trees on the Reservation to the point where white pine would cease to be a tree of commercial importance if no control work had been done. However, not only was blister rust control work performed as early as 1918 around the points where infection was then found, but reasonably sustained ribes eradication work has been done ever since. As a result, white pine reproduction is coming up on protected areas in a very satisfactory manner. According to surveys and estimates, the acreage increase of white pine resulting from natural seeding continues to exceed the annual cut and loss from fire. Since forest management on the Menominee Indian Reservation is predicated on a sustained yield basis, it is important that the annual growth of white pine continues to exceed its annual cut.

A 5 year work plan for a possible post-war period was prepared jointly in 1944, and approved by the Forest Supervisor. There is a specific plan for the coming field season, approved by the Forest Supervisor. Initial work around young white pine stands is practically completed. In Fiscal Year 1950 it is planned to work 3,391 acres mostly as rework, to protect 2,165 acres of white pine at a cost of 2,020 man-days. On the Menominee Reservation since 1943 Indian Service Regular funds (3107) have been matched by Tribal funds for blister rust control work.

Expenditures

Expenditures for ribes eradication by Indian Reservations and sources of funds for 1948 are shown in Text Table 15. Regular Indian Service (3107 and 77) funds were spent on eight reservations in the total amount of \$77,620.50. In addition \$6,972.70 of Menominee Indian Tribal funds were used in local control, making a total of \$84,593.20 furnished by the Indian Service. In addition, chiefly for mapping, surveying, checking, technical supervision, keeping of records, etc., Bureau of Entomology and Plant Quarantine funds were spent as part of its responsibilities towards the control program on Indian Service lands.

Recommendations for 1949

Specific recommendations are given in discussions of the work on each reservation. In addition, work plans and budgets prepared cooperatively between the representatives of the Indian Service and the Blister Rust Control Organization have been supplied.

In general, work recommended for the coming field season is shown for those areas most immediately in need of such working after taking into full consideration the availability of labor. Following the successful use of Indian women on ribes eradication since 1943, it is probable that continued use of this type of labor will be made in 1949 although men will be used in increasing numbers.

Excellent stands of white pine are found on the Indian Reservations. Some of the best virgin white pine remaining in this Region are found on the Menominee Reservation. On practically all of the reservations, white pine reproduction, particularly in recent years, is seeding in naturally in gratifying amounts. Ribes conditions, generally speaking are decidedly heavier on the Reservations than the average for the Region. Blister Rust infection on both pines and ribes has been known to exist either on or close to the Reservations for a good many years. Thus, if no blister rust control work had been performed, white pine in commercial forests for the future would have been precluded because necessary white pine reproduction would have been destroyed by blister rust before it reached maturity.

However, due to the timely and continued protection against blister rust of these young stands, performed cooperatively between the Indian Service and the Blister Rust Control Organization, there are at present no large areas in Indian Service ownership on which serious loss from the rust has occurred. Plans for the fiscal year 1949 for continuing most immediately needed control work, are part of an intelligent over-all plan to assure the continued production of white pine without serious loss from blister rust.

Text Table 11. Local Control on Indian Reservations, All Performed by Indian Service,
North Central Region, 1948

Indian Reservation	No. Areas	Acres		Total	Control Area Worked	Ribes Bushes Destroyed	8-Hour Man- Days Used
		Natural	Planted				
Initial Working							
Bad River, Wis.	5	887	-	887	1,442	11,719	118
Lac Court Oreilles, Wis.	9	1,125	-	1,125	1,868	31,321	319
Lac du Flambeau, Wis.	22	3,111	31	3,142	5,563	62,952	547
Menominee, Wis.	8	1,942	-	1,942	3,070	66,784	960
Total, Initial Working	44	7,065	31	7,096	11,943	172,776	1,946
Second Working							
Grand Portage, Minn.	2	245	-	245	335	135,000	669
Nett Lake, Minn.	2	47	39	86	112	7,500	191
White Earth, Minn.	2	44	-	44	111	68,334	147
Red Lake, Minn.	14	765	-	765	2,079	3,112	94
Bad River, Wis.	2	227	-	227	408	94,256	520
Lac Court Oreilles, Wis.	2	883	-	883	1,278	188,517	955
Total, Second Working	24	2,311	79	2,390	4,323	456,719	2,576
Third and Other Workings							
Grand Portage, Minn.	2	183	-	183	225	24,500	164
Nett Lake, Minn.	4	1,059	87	1,146	1,309	142,800	990
White Earth, Minn.	3	227	-	227	375	88,323	198
Red Lake, Minn.	15	1,654	40	1,694	2,861	705,095	2,541
Bad River, Wis.	2	281	-	281	543	87,983	545
Lac Court Oreilles, Wis.	1	25	-	25	218	167	8
Menominee, Wis.	2	915	-	915	1,640	16,322	676
Total, Third and Other Workings	29	4,344	127	4,471	7,171	1,065,190	5,226
All Workings							
Grand Portage, Minn.	4	428	-	428	560	159,500	833
Nett Lake, Minn.	6	1,106	126	1,232	1,421	150,300	1,181
White Earth, Minn.	5	271	-	271	486	156,657	345
Red Lake, Minn.	29	2,419	40	2,459	4,940	708,207	2,635
Bad River, Wis.	9	1,395	-	1,395	2,393	193,958	1,183
Lac Court Oreilles, Wis.	12	2,033	-	2,033	3,364	220,005	1,282
Lac du Flambeau, Wis.	22	3,111	31	3,142	5,563	62,952	547
Menominee, Wis.	10	2,857	-	2,857	4,710	83,106	1,636
Region Total, All Workings	97	13,690	197	13,887	23,157	1,734,685	9,649

| Text Table 12. Results of Checking After Ribes Eradication on Indian Reservations,
North Central Region, 1948

Indian Reservation	No. Areas	Checking After Eradication				Classification of Worked Areas on Basis of Ribes F.L.S. per Acre After Working				Percent Acreage With 25 FLS or More per Acre After Working
		Acres Worked and Checked	Strip Acres	Ribes Bushes	Found F.L.S.	Ribes per Acre Bushes F.L.S.	0.0 - 15.0 FLS (Acres)	15.1 - 25.0 FLS (Acres)		
Net Lake, Minnesota	6	1,421	8.03	48	59.0	6.0	7.3	1,421	-	100.0
White Earth, Minnesota	3	375	4.89	35	71.5	7.2	14.6	225	150	100.0
Red Lake, Minnesota	6	1,617	33.24	394	437.0	11.9	13.1	937	434	84.8
Bad River, Wisconsin	7	1,338	40.90	143	173.5	3.5	4.2	1,338	-	100.0
Lac Court Oreilles, Wisconsin	11	3,009	48.80	183	280.5	3.8	5.7	3,009	-	100.0
Lac du Flambeau, Wisconsin	1	647	2.00	15	28.0	7.5	14.0	647	-	100.0
Menominee, Wisconsin	8	4,427	68.50	274	514.6	4.0	7.5	4,357	70	100.0
Region Total	42	12,834	206.36	1,092	1,564.1	5.3	7.6	11,934	694	93.1
									246	

Note: In 1948, 97 areas with 23,437 acres were worked. Only slightly over half of this acreage was given a formal, quantitative check in 1948, but much of it was examined administratively and found satisfactory. On some areas the formal check was postponed until spring because many of the bushes had been cut off and the stumps treated with 2, 4-D. Sprouts might not appear until next spring.

Text Table 13. Status of Control on Indian Reservations, North Central Region, on December 31, 1948

Indian Reservation	Total Control Problem, Acres		Acres Initially Worked		Acres Not Initially Worked		Acres On Maintenance		Percent White Pine	
	White Pine	Natural Planted	Total	Control Area	White Pine	Natural Planted	Total	Control Area	White Pine	Natural Planted
Sac Fox	45	45	45	500	-	45	45	500	-	100.0
	-	-	-	-	-	-	-	-	-	0.0
Iowa										
Grand	974	974	974	1,271	-	974	974	1,271	-	100.0
	78	78	78	186	-	78	78	186	-	100.0
Portage	5,110	5,252	5,252	7,136	20	5,232	5,232	7,093	3,674	5,010
Vermilion	2,432	2,432	2,432	3,387	-	2,432	2,432	3,387	2,076	2,755
Notch Lake	481	481	481	1,063	-	481	481	1,063	231	545
Leech Lake	12,231	12,473	12,473	19,682	-	12,473	12,473	19,682	6,757	9,247
White Earth	-	-	-	-	-	-	-	-	-	-
Red Lake	-	-	-	-	-	-	-	-	-	-
Total, Minn.	21,306	21,690	21,690	32,725	20	21,670	21,670	32,682	12,738	17,557
Wisconsin										
Bad River	8,290	8,290	8,290	15,294	400	7,890	7,890	13,704	5,676	9,644
Lac Court Oreilles	12,140	12,600	12,600	24,000	1,211	11,389	11,389	20,136	3,272	6,484
Lac du Flambeau	10,812	10,858	10,858	20,257	1,166	9,692	9,692	18,254	7,563	14,721
Menominee	18,561	18,813	18,813	32,277	1,783	17,030	17,030	29,072	5,668	9,560
Total, Wis.	49,803	50,561	50,561	91,828	4,560	46,001	46,001	81,165	22,179	33,869
Region Total	71,109	72,251	72,251	124,553	24,560	67,711	67,711	114,847	34,917	51,426

Text Table 14. Summary of Local Control Performed on Indian Reservations, North Central Region, From Inception to December 31, 1948. Work Done by Indian Service Except as Noted. Gross Acres

Indian Reservation	Acres White Pine Protected	Acres Worked	Ribes Destroyed	8-Hour Man- Days Used	Average Per Acre Worked	
	Ribes				Man- Days	
<u>Initial Working</u>						
Saw-Fox, Iowa	45	500	13,462	169	26.9	0.34
Grand Portage, Minn.	1,012	1,620	2,367,154	4,525	1461.2	2.79
Leech Lake, Minn. (a)	2,562	3,323	378,885	1,007	114.0	0.30
Wett Lake, Minn.	4,497	7,126	527,722	1,841	74.1	0.26
Vermilion, Minn.	72	286	137,530	424	480.9	1.48
White Earth, Minn. (b)	466	1,354	398,705	1,178	294.5	0.87
Red Lake, Minn.	13,174	20,168	6,740,408	11,216	344.2	0.56
Red River, Wis.	7,514	14,673	8,216,882	18,888	560.0	1.29
Lac Court Oreilles, Wis.	8,821	17,422	1,413,731	10,601	81.1	0.61
Lac du Flambeau, Wis.	9,295	18,422	746,331	4,146	40.5	0.23
Menominee, Wis.	22,129	36,937	10,296,759	34,323	278.8	0.93
Total, Initial Working	69,587	121,831	31,237,569	88,318	256.4	0.72

Includes work done on

Bureau-State funds as follows:

(a) Leech Lake, Minn.	=	1,675	52,533	275	31.4	0.16
(b) White Earth, Minn.	=	982	252,747	693	257.4	0.71
Total Bureau-State Funds	=	2,657	305,280	968	114.9	0.36

Second Working

Sac-Fox, Iowa	10	206	3,592	57	17.4	0.28
Grand Portage, Minn.	469	651	289,501	1,064	444.7	-
Leech Lake, Minn. (c)	2,288	3,012	197,460	831	65.6	0.28
Wett Lake, Minn.	3,053	3,489	310,850	2,478	89.1	-
Vermilion, Minn.	72	206	29,912	210	145.2	1.02
White Earth, Minn.	481	918	204,927	673	223.2	-
Red Lake, Minn.	11,322	16,831	1,524,511	6,245	90.6	-
Red River, Wis.	3,143	6,085	1,216,368	4,991	199.9	0.82
Lac Court Oreilles, Wis.	3,441	6,813	390,621	2,709	57.3	0.40
Lac du Flambeau, Wis.	2,080	6,032	46,443	370	7.7	0.06
Monominee, Wis.	9,865	17,362	1,693,527	13,712	97.5	0.79
Total, Second Working	36,224	61,605	5,507,712	33,340	95.9	0.54

Includes work done on

Bureau-State Funds as follows:

(c) Leech Lake, Minn.	=	632	44,189	211	69.9	0.33
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Text Table 14. (Cont'd) Summary of Local Control Performed on Indian Reservations, North Central Region, from Inception to December 31, 1948. Work Done by Indian Service Except as Noted. Gross Acres

Indian Reservation	Acres White Pine Protected	Acres Worked	Ribes Destroyed	8-Hour Man- Days Used	Average Per Acre Worked	Man- Days
<u>Third and Other Workings</u>						
Grand Portage, Minn.	208	275	43,546	267	158.3	0.97
Leech Lake, Minn.	365	502	90,689	376	180.7	0.75
Nett Lake, Minn.	1,218	1,416	164,080	1,330	115.9	0.94
Vermilion, Minn.	150	372	40,252	418	108.2	1.12
White Earth, Minn.	453	808	134,029	543	165.9	0.67
Red Lake, Minn.	8,920	12,823	1,128,585	6,051	88.0	0.47
Bad River, Wis.	2,529	3,994	541,738	2,397	135.6	0.60
Lac Court Oreilles, Wis.	213	1,338	5,672	224	4.2	0.17
Menominee, Wis.	2,602	4,696	143,257	2,619	30.5	0.56
Total Third and Other Workings	16,658	26,224	2,291,848	14,225	87.4	0.54
<u>All Workings</u>						
Sac-Fox, Iowa	55	706	17,054	226	24.2	0.32
Grand Portage, Minn.	1,689	2,546	2,700,201	5,856	1,060.6	2.30
Leech Lake, Minn. (d)	5,215	6,837	667,034	2,214	97.6	0.32
Nett Lake, Minn.	8,768	12,031	1,002,652	5,649	83.3	0.47
Vermilion, Minn.	294	864	207,694	1,052	240.4	1.22
White Earth, Minn. (e)	1,400	3,080	737,661	2,394	239.5	0.78
Red Lake, Minn.	33,416	49,822	9,393,504	23,512	188.5	0.47
Bad River, Wis.	13,186	24,752	9,974,988	26,276	403.0	1.06
Lac Court Oreilles, Wis.	12,475	25,573	1,810,024	13,534	70.8	0.53
Lac du Flambeau, Wis.	11,375	24,454	792,774	4,516	32.4	0.18
Menominee, Wis.	34,596	58,995	12,133,543	50,654	205.7	0.86
Total, All Workings	122,469	209,660	39,437,129	135,833	188.1	0.65
Includes work done on Bureau-State Funds:						
(d) Leech Lake	-	2,307	96,722	486	41.9	0.21
(e) White Earth	-	982	252,747	693	257.4	0.71
Total, Bureau-State Funds	-	3,289	349,469	1,179	106.3	0.36

Text Table 15. Indian Service Funds Spent on Blister Rust Control,
North Central Region, Calendar Year 1948

Agency	Reservation	I. S. 3107 F. Y. 1948 Jan. - June	I. S. 77 F. Y. 1949 July - Dec.	Total
Consolidated Chippewa, Minnesota	Grand Portage	\$3,153.80	\$4,778.96	\$7,932.76
	Nett Lake	3,825.90	6,937.66	10,763.56
	White Earth	2,560.07	-	2,560.07
	Sub-total	9,539.77	11,716.62	21,256.39
Red Lake, Minnesota	Red Lake	14,036.24	10,360.41	24,396.65
Great Lakes, Wisconsin	Bad River	5,118.51(a)	5,063.57	10,182.08
	Lac Court Oreilles	5,301.11(b)	4,793.58	10,094.69
	Lac du Flambeau	2,228.60	2,565.00	4,793.60
	Sub-total	12,648.22	12,422.15	25,070.37
Menominee, Wisconsin	Menominee	3,458.74	3,438.35	6,897.09
	Tribal funds	3,572.70	3,400.00	6,972.70
	Sub-total	7,031.44	6,838.35	13,869.79
Region Total		13,255.67	47,337.53	84,593.20

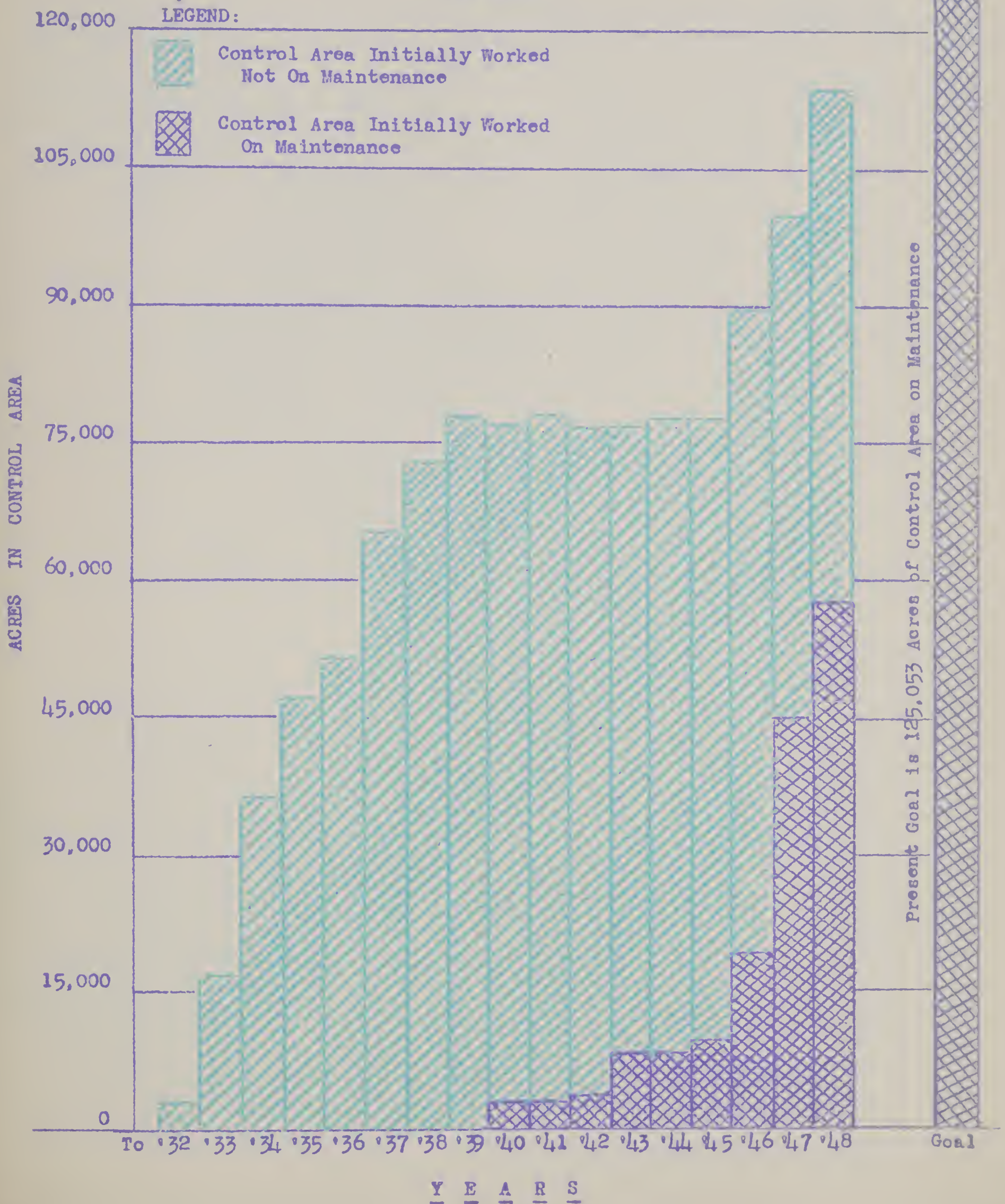
(a) Includes \$731.29 of F. Y. funds not previously reported. (1948)

(b) Includes \$283.66 of F. Y. funds not previously reported. (1948)

C H A R T 12

STATUS OF CONTROL AT END OF EACH YEAR AS SHOWN
INDIAN SERVICE LANDS - NORTH CENTRAL REGION

Net Acres



STATUS OF CONTROL BY INDIAN RESERVATIONS

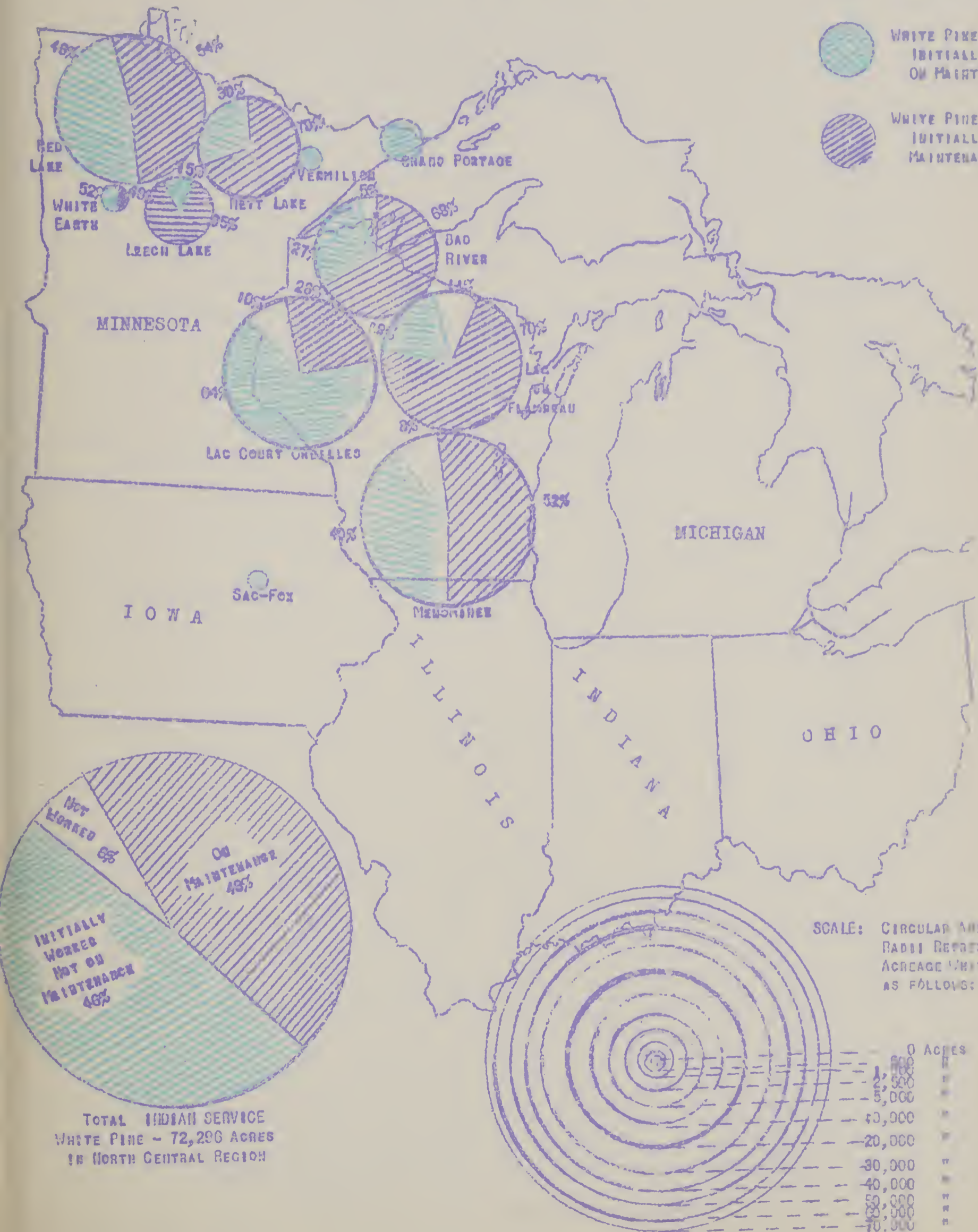
NORTH CENTRAL REGION
On December 31, 1948
(Based on Text Table 13)

LEGEND:

WHITE PINE NOT
PROTECTED

WHITE PINE WORKING
INITIALLY BUT NOT
ON MAINTENANCE

WHITE PINE WORKING
INITIALLY AND IS
ON MAINTENANCE



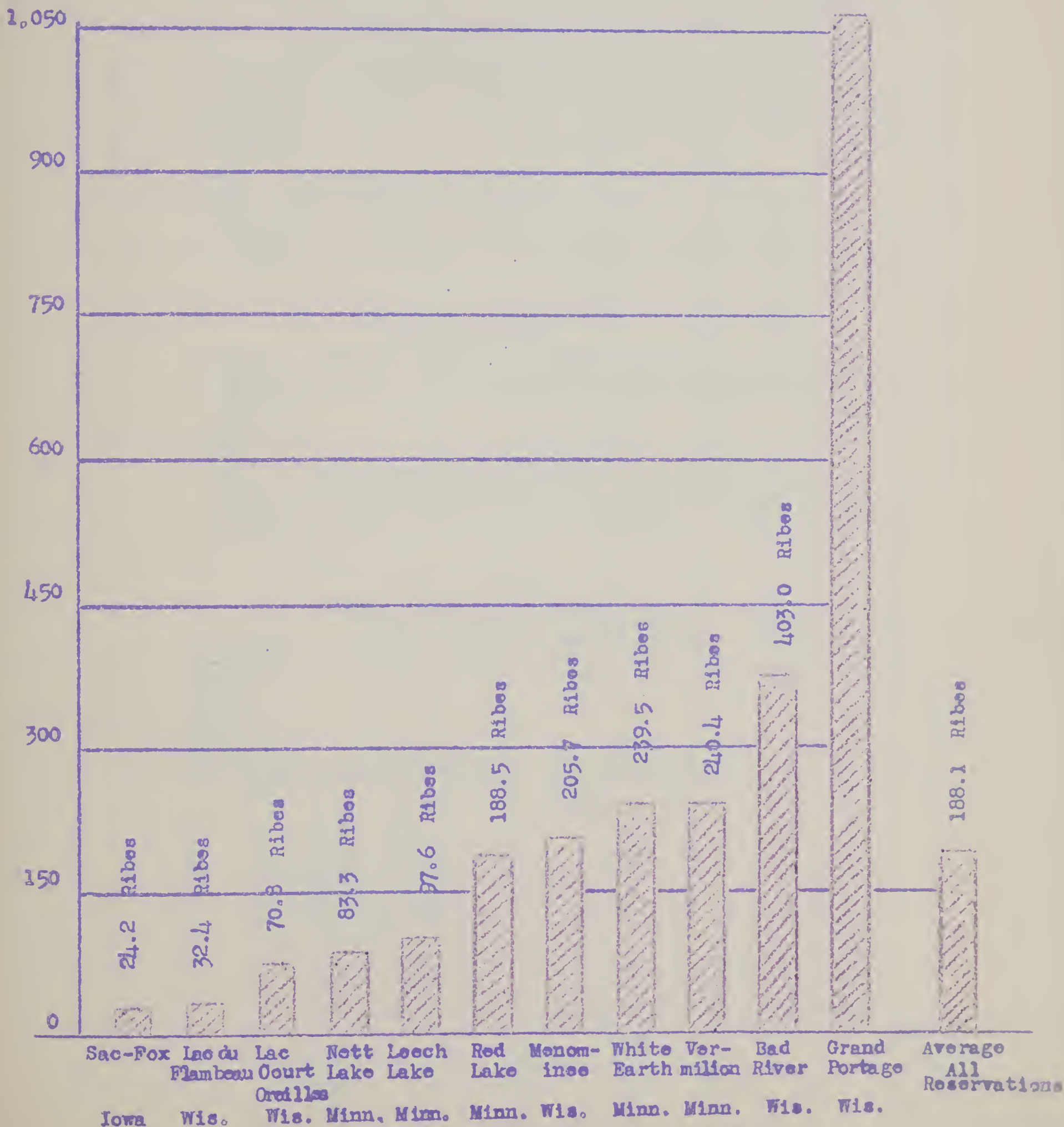
C H A R T 14

NUMBER OF RIBES DESTROYED PER ACRE, ALL WORKINGS,

BY INDIAN RESERVATIONS

NORTH CENTRAL REGION
To December 31, 1948
(Based on Text Table 14)

NUMBER OF RIBES BUSHES DESTROYED PER ACRE



I N D I A N R E S E R V A T I O N S

Table 2. Summary of Local Control by States and Operating Agencies,
North Central Region, 1948

State	Operating Agency	Number Areas Worked	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-Hour Men-Days Used
			Natural	Planted			
Initial Working							
Illinois	Bureau-State	1	-	20	20	108	182
Indiana	Bureau-State	0	-	48	48	500	43
Iowa	Bureau-State	6	10	19	29	180	24,188
Ohio	Bureau-State	21	-	290	290	1,846	5,881
Michigan	Bureau-State	32	1,655	253	1,908	5,323	25,917
	Forest Service	19	823	352	1,175	3,235	68,318
	Total	51	2,478	605	3,083	8,558	24,235
Minnesota	Bureau-State	8	95	23	118	489	38,918
	Forest Service	16	2,238	-	2,238	3,043	146,504
	Total	24	2,333	23	2,356	3,532	185,422
Wisconsin	Bureau-State	165	12,858	376	13,234	52,103	132,041
	Forest Service	4	653	27	680	910	33,929
	Indian Service	44	7,065	31	7,096	11,943	172,776
	Total	213	20,576	434	21,010	64,956	378,746
Region	Bureau-State	241	14,618	1,029	15,647	60,649	227,170
	Forest Service	39	3,714	379	4,093	7,188	248,751
	Indian Service	44	7,065	31	7,096	11,943	172,776
Region Total, Initial		324	25,397	1,439	26,836	79,780	648,697
							6,178

(Cont'd.)

Table 2. (Cont'd) Summary of Local Control by States and Operating Agencies,
North Central Region, 1948

State	Operating Agency	Number Areas Worked	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-Hour Man-Days Used
			Natural	Planted			
			Second Working				
Indiana	Bureau-State	4	-	302	302	0	1
Iowa	Bureau-State	7	1	63	63	21,643	136
Ohio	Bureau-State	28	-	527	527	2,835	91
Michigan	Bureau-State	25	2,916	88	3,004	60,929	395
	Forest Service	13	865	180	1,045	20,719	318
	Total	38	3,781	268	4,049	81,648	193
Minnesota	Bureau-State	4	360	-	360	27,906	304
	Forest Service	11	609	267	876	65,062	821
	Indian Service	20	1,101	39	1,140	213,946	1,101
	Total	25	2,070	306	2,376	306,914	2,226
Wisconsin	Bureau-State	28	1,817	639	2,456	46,308	373
	Forest Service	12	3,005	560	3,565	91,308	1,845
	Indian Service	4	1,110	-	1,110	282,773	1,475
	Total	44	5,932	1,199	7,131	620,389	3,693
Region	Bureau-State	96	5,024	1,618	6,712	159,621	1,303
	Forest Service	36	4,479	1,007	5,486	177,089	2,984
	Indian Service	24	2,211	39	2,250	496,719	2,576
Region Total, Second		156	11,704	2,654	14,348	833,429	6,863

(Cont'd.)

Table 2.

North Central Region, 1948

State	Operating Agency	Number Areas Worked	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-Hour Man-Days Used
			Natural	Planted			
Third and Subsequent Workings							
Indiana	Bureau-State	1	-	25	25	252	2
Iowa	Bureau-State	2	5	11	16	89	19
Ohio	Bureau-State	5	-	39	39	5,669	3
Michigan	Bureau-State	24	2,512	502	3,014	27,898	481
	Forest Service	7	590	1,203	1,793	27,304	572
Minnesota	Total	31	3,102	1,705	4,807	55,202	1,053
	Bureau-State	4	145	100	245	61,546	371
	Forest Service	8	42	681	723	25,620	631
	Indian Service	24	3,123	127	3,250	960,718	3,893
Wisconsin	Total	36	3,310	908	4,218	1,047,884	4,895
	Bureau-State	5	987	844	1,831	151,486	1,276
	Forest Service	2	80	215	295	2,641	54
	Indian Service	5	1,221	-	1,221	104,472	1,229
Region	Total	12	2,288	1,059	3,347	258,599	2,559
	Bureau-State	39	3,649	1,521	5,170	246,959	2,182
	Forest Service	17	712	2,099	2,811	55,565	1,257
	Indian Service	29	4,344	127	4,471	1,065,190	5,122
Region Total, Third and Subsequent		85	8,705	3,747	12,452	1,367,714	8,561

Table 2. (Cont'd.) Summary of Local Control by States and Operating Agencies
North Central Region, 1948

State	Operating Agency	Number Areas Worked	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-Hour Man-Days Used
			Natural	Planted			
All Workings							
Illinois	Bureau-State	1	-	20	108	182	1
Indiana	Bureau-State	13	-	375	1,718	295	7
Iowa	Bureau-State	15	16	92	108	505	330
Ohio	Bureau-State	92	-	656	6,229	8,824	181
Michigan	Bureau-State	81	7,083	843	7,926	114,744	1,229
	Forest Service	39	2,278	1,735	4,013	116,341	1,378
Minnesota	Total	120	9,361	2,578	11,939	231,085	2,607
	Bureau-State	16	600	123	723	128,370	826
	Forest Service	35	2,889	948	3,837	237,186	3,392
	Indian Service	44	4,224	166	4,390	1,174,664	4,994
Wisconsin	Total	95	7,713	1,237	8,950	1,340,220	9,212
	Bureau-State	198	15,662	1,859	17,521	329,835	2,429
	Forest Service	18	3,738	802	4,540	127,878	2,187
	Indian Service	53	9,396	31	9,427	560,021	4,648
Region	Total	269	28,796	2,692	31,488	1,017,734	9,264
	Bureau-State	376	23,361	4,168	27,529	633,750	5,003
	Forest Service	92	8,905	3,485	12,390	481,405	6,957
	Indian Service	97	13,620	197	13,817	1,734,685	9,642
Region Total, All Workings			45,886	7,850	53,736	2,849,840	20,602

Table 2A. Summary of Local Control by States and Ownership Classes
North Central Region, 1948

State	Ownership Class	Forest	Number of Areas	Acres White Pine Protected		Acres Worked	Number Fishes Destroyed	Total	
				Natural	Planted			8-Hour Men-Days Used	
Initial Working									
Illinois	State & Private	Private	1	-	20	108	182	1	
	State & Private	Private	3	-	49	500	113	4	
	State & Private	Non-Fed. Public	1	-	5	40	7,321	30	
		Private	5	10	14	140	16,867	115	
State Total				10	19	180	24,188	147	
Ohio	State & Private	Non-Fed. Public	2	-	115	477	5,102	71	
		Private	19	-	175	1,469	779	13	
State Total				-	290	1,946	5,881	84	
Michigan	State & Private	Non-Fed. Public	3	330	25	980	2,279	72	
		Private	24	1,128	68	3,103	22,505	250	
	State Total		27	1,458	93	4,083	24,784	322	
	Forest Service		1	40	-	105	11	2	
		Manistee N.F.	12	470	352	2,260	17,623	60	
		Marquette N.F.	1	40	-	180	64	5	
		Hiawatha N.F.	4	182	160	1,020	2,150	38	
		Ottawa N.F.	6	288	-	910	49,603	444	
	State Total		24	1,020	512	4,475	69,451	519	
	State & Private	Private	51	2,478	605	8,558	94,235	841	
Minnesota	Forest Service		3	95	118	489	28,918	151	
	Superior N.F.	12	2,107	-	2,107	2,870	114,189	1,846	
	Chippewa N.F.	4	131	-	131	173	32,315	94	
	State Total		16	2,238	-	3,043	146,504	1,940	
State Total				24	2,333	3,532	185,422	2,091	

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1948

State	Ownership Class	Forest	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-Hour Man-Day Used
				Natural	Planted			
Wisconsin	State & Private	Non-Fed. Public	12	5,372	217	5,589	102,733	579
		Private	153	7,486	159	7,645	29,308	201
	Forest Service	Sub-Total	165	12,858	376	13,234	132,041	780
		Chequamegon N.F.	3	310	-	310	21,344	148
		Nicolet N.F.	1	343	27	370	12,585	140
	Indian Service	Sub-Total	4	653	27	680	33,929	240
		Bad River	5	887	-	887	11,719	110
		Lac Court Oreilles	9	1,125	-	1,125	31,321	349
		Lac du Flambeau	22	3,111	31	3,142	62,952	547
		Menominee	8	1,942	-	1,942	66,784	950
Region	State Total	Sub-Total	44	7,065	31	7,096	172,776	1,240
		Non-Fed. Public	213	20,576	434	21,010	788,766	3,023
	Forest Service	Private	218	5,702	362	6,064	117,435	752
		Sub-Total	236	8,719	507	9,226	108,602	735
	Indian Service	All Forests	44	14,121	869	15,290	226,057	1,467
		All Forests	44	7,911	573	8,484	219,884	2,747
	Region Total, Initial		342	25,397	1,439	26,836	848,637	6,176

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1948

State	Ownership Class	Forest	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total Preserved	Total Used	
				Natural	Planted					
										Total
Second Working										
Indiana	State & Private	Private	1	-	302	302	-	1,023	-	
Iowa	State & Private	Non-Fed. Public	3	1	51	52	19,514	110	110	
		Private	4	-	11	11	2,129	21	21	
State Total				1	82	63	21,643	135	135	
Ohio	State & Private	Non-Fed. Public	5	-	251	251	1,693	65	65	
		Private	23	-	276	276	1,142	29	29	
State Total				-	527	527	2,835	94	94	
Michigan	State & Private	Non-Fed. Public	8	1,310	88	1,398	8,253	90	90	
		Private	15	1,406	-	1,406	52,482	302	302	
	Sub-Total				23	2,804	60,735	392	392	
	Forest Service	Manistee N.F.	8	150	180	330	5,850	49	49	
		Marquette N.F.	1	95	-	95	7,054	132	132	
		Hiawatha N.F.	5	765	-	765	2,085	100	100	
		Ottawa N.F.	1	55	-	55	770	40	40	
Sub-Total				15	1,065	180	20,913	221	221	
Minnesota	State Total		25	3,781	268	4,049	81,618	713	713	
	State & Private	Non-Fed. Public	3	335	-	335	21,525	283	283	
		Private	1	25	-	25	6,380	21	21	
	Sub-Total				4	360	360	27,906	304	304
	Forest Service	Superior N.F.	4	511	140	651	29,927	533	533	
		Chippewa N.F.	7	98	127	225	35,135	288	288	
	Sub-Total				11	609	267	65,062	821	821
Indian Service	Grand Portage		2	245	-	245	135,000	659	659	
	Nett Lake		2	47	39	86	7,500	191	191	
	White Earth		2	44	-	44	68,334	147	147	
	Red Lake		14	765	-	765	3,112	94	94	
Sub-Total				20	1,101	39	213,046	1,101	1,101	
State Total				35	2,070	396	306,914	2,226	2,226	

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1948

State	Ownership Class	Forest	Number Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total	
				Natural	Planted			8-Hour Man-Day Used	
Wisconsin	State & Private	Non-Fed. Public	7	955	520	1,475	37,676	242	
		Private	21	862	119	981	8,632	131	
	Forest Service	Sub-Total	28	1,817	639	2,456	46,308	373	
		Chequamegon N.F.	11	3,005	360	3,365	84,940	1,681	
		Nicolet N.F.	1	-	200	200	6,368	164	
	Indian Service	Sub-Total	12	3,005	560	3,565	91,308	1,845	
		Bad River	2	227	-	227	94,256	520	
		Leo Court Oreilles	2	883	-	883	188,517	955	
	State & Private	Sub-Total	4	1,110	-	1,110	282,773	1,175	
		Non-Fed. Public	26	2,601	910	3,511	420,309	3,696	
Region	State & Private	Private	68	2,293	708	3,001	88,662	792	
		Sub-Total	94	4,894	1,618	6,512	70,765	508	
	Forest Service	All Forests	93	4,679	1,007	5,686	159,427	1,300	
		Indian Service	1	2,211	32	2,250	177,283	2,987	
	Region Total, Second		156	11,784	2,664	14,448	677,129	6,869	
	Third and Subsequent Workings								
	Indiana	State & Private	Private	1	-	25	125	352	2
		State & Private	Non-Fed. Public	1	5	10	84	5,655	47
			Private	1	-	1	5	14	2
	Region Total			3	5	15	89	5,669	49

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1948

State	Ownership Class	Forest	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	8-Hour Man-Day Used
				Natural	Planted			
Third and Subsequent Workings (Cont'd.)								
Ohio	State & Private	Private	3	-	39	233	108	3
Michigan	State & Private	Non-Fed. Public	5	264	196	1,073	2,078	91
		Private	16	2,070	6	5,551	25,632	387
		Sub-Total	21	2,334	202	6,824	27,710	1,178
Forest Service		Manistee N.F.	3	65	278	654	400	11
		Marquette N.F.	2	60	300	640	2,852	74
		Kewatha N.F.	2	635	-	1,320	2,326	56
		Ottawa N.F.	3	-	925	1,711	21,914	434
		Sub-Total	10	760	1,503	4,325	27,492	525
State Total								
Minnesota	State & Private	Private	31	3,102	1,705	10,949	55,202	1,053
Forest Service		Superior N.F.	4	145	100	632	61,546	371
		Indian Service	8	142	681	926	25,630	631
		Grand Portage	2	183	-	225	24,500	164
		Nett Lake	4	1,059	87	1,146	142,800	990
		White Earth	3	227	-	375	88,323	198
		Red Lake	15	1,654	40	1,694	705,095	2,541
		Sub-Total	21	3,123	127	4,770	960,718	3,893
State Total								
Wisconsin	State & Private	Non-Fed. Public	30	3,310	908	6,388	1,047,884	4,895
Forest Service		Chequamegon N.F.	5	987	844	3,394	151,486	1,276
		Indian Service	2	80	215	365	2,641	54
		Bad River	2	281	-	543	87,983	545
		Lac Court Oreilles	1	25	-	218	167	8
		Monominee	2	915	-	1,640	16,322	676
		Sub-Total	5	1,221	-	2,401	104,472	1,229
State Total								
			12	2,288	1,059	6,160	258,599	2,529

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1948

State	Ownership Class	Forest	Number of Areas	Acres White Pine Protected			Acres Worked	Number Ribes Destroyed	Total 8-Hour Man-Days Used
				Natural	Planted	Total			
Third and Subsequent Workings (Cont'd.)									
Region	State & Private Non-Fed. Public	Private	11	1,256	1,050	2,306	4,551	159,219	1,414
		Sub-Total	25	2,223	171	2,394	6,606	87,552	765
	Forest Service All Forests	All Forests	36	3,479	1,221	4,700	11,157	246,771	2,179
		Indian Service All Forests	20	882	2,399	3,281	5,616	55,753	1,260
	Indian Service All Forests		29	4,244	127	4,371	7,171	1,065,190	5,122
Region Total, Third and Subsequent				85	8,705	3,747	23,944	1,367,714	6,551
All Workings									
Illinois	State & Private Private	Private	1	-	20	20	108	182	1
		Sub-Total	15	-	373	373	1,718	235	7
	State & Private Non-Fed. Public	Private	5	6	66	72	334	32,490	189
		Sub-Total	10	10	26	36	171	19,010	141
	State Total		15	16	92	108	505	51,500	130
Ohio	State & Private Non-Fed. Public	Private	7	-	366	366	1,959	6,795	136
		Sub-Total	45	-	490	490	4,270	2,029	45
	State & Private Non-Fed. Public	Private	52	-	856	856	8,229	6,884	182
		Sub-Total	16	1,904	309	2,213	5,155	12,610	253
	State Total		55	4,612	74	4,686	11,819	100,619	939
Region Total, Third and Subsequent				73	6,516	787	19,914	117,829	1,192

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1948

State	Ownership Class	Forest	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Totals 8-Hour Man-Day Used
				Natural	Planted			
Michigan (Cont'd.)	Forest Service	Huron N.F.	1	40	-	40	11	2
		Manistee N.F.	23	685	810	1,495	23,883	120
		Marquette N.F.	4	195	300	495	9,970	211
		Hiawatha N.F.	11	1,582	160	1,742	11,705	154
		Ottawa N.F.	10	343	925	1,268	72,287	888
	Sub-Total		49	2,845	2,195	5,040	117,856	1,445
	State Total		100	2,361	2,578	11,939	231,085	2,607
	State & Private Non-Fed. Public	Private	13	265	123	388	21,526	28
		Sub-Total	16	600	123	723	106,844	51
		Superior N.F.	21	2,660	821	3,481	128,370	826
Chippewa N.F.		11	229	127	356	169,736	3,010	
Sub-Total		35	2,889	948	3,837	67,450	382	
Indian Service	Grand Portage	4	428	-	428	237,186	3,352	
	Nott Lake	6	1,106	126	1,232	159,500	83	
	White Earth	5	271	-	271	150,300	1,181	
	Red Lake	29	2,419	40	2,459	156,657	345	
	Sub-Total	44	4,224	166	4,390	708,207	2,635	
State Total		95	7,713	1,237	8,950	1,174,664	4,994	
State & Private Non-Fed. Public	Private	24	7,314	1,581	8,895	1,510,280	2,212	
	Sub-Total	174	8,348	278	8,626	291,895	2,097	
	Chequamegon N.F.	16	3,395	575	3,970	329,835	2,429	
	Nicolet N.F.	2	343	227	570	108,925	1,883	
	Sub-Total	18	3,738	802	4,540	18,953	30	
Wisconsin	Forest Service	Sub-Total	18	3,738	802	4,540	127,878	2,187
		State Total	18	3,738	802	4,540	127,878	2,187
	State & Private Non-Fed. Public	Private	24	7,314	1,581	8,895	1,510,280	2,212
		Sub-Total	174	8,348	278	8,626	291,895	2,097
		Chequamegon N.F.	16	3,395	575	3,970	329,835	2,429
		Nicolet N.F.	2	343	227	570	108,925	1,883
		Sub-Total	18	3,738	802	4,540	18,953	30

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1948

State	Ownership Class	Forest	Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total	
				Natural	Planted			8-Hour Man-Days Used	
Wisconsin (Cont'd.)	All Workings (Cont'd.)								
	Indian Service	Bad River	9	1,395	-	1,395	2,393	193,958	1,183
		Lac Court Oreilles	12	2,033	-	2,033	3,364	220,005	1,282
		Lac du Flambeau	22	3,111	31	3,142	5,563	62,952	527
		Menominee	10	2,857	-	2,857	4,710	83,106	1,636
		Sub-Total	53	9,396	31	9,427	16,030	560,021	4,448
	State Total		269	20,796	2,692	23,488	85,506	1,017,734	9,281
	State & Private	Non-Fed. Public	55	9,559	2,322	11,881	33,239	365,316	2,958
		Private	311	13,235	1,386	14,621	56,076	266,919	2,008
		Sub-Total	366	22,794	3,708	26,502	89,315	632,235	4,966
Region	Forest Service	All Forests	102	9,472	3,245	13,417	24,882	182,980	6,924
	Indian Service	All Forests	97	13,620	197	13,817	23,437	1,734,605	9,892
	Region Total, All Workings		565	45,886	7,890	53,736	137,634	2,849,840	21,602

Table 3. Summary of Local Control by Ownership Classes and Operating Agencies,
North Central Region, 1948

Ownership Class	Operating Agency	Number Areas	Acres White Pine Protected		Acres Worked	Number Ribs Destroyed	1948 Man Used
			Natural	Planted	Total		
Non-Fed. Public Private	Bureau-State	10	Initial Working		6,064	117,435	752
	Bureau-State	219	2,102	362			
	Bureau-State	5	6,719	507	9,226	108,602	735
	Forest Service	39	197	160	357	1,133	
	Total	44	3,714	379	4,093	218,751	2,716
Indian Service	Indian Service	44	3,911	539	4,450	249,894	2,717
	Indian Service	44	7,065	31	7,096	172,776	1,911
	All Agencies	324	25,397	1,439	26,836	648,697	6,178
Non-Fed. Public Private	Bureau-State	26	Second Working		3,511	88,662	792
	Bureau-State	68	2,601	910			
	Bureau-State	2	2,293	708	3,001	70,765	508
	Forest Service	36	200	-	200	194	
	Total	39	4,479	1,007	5,486	177,089	2,984
Indian Service	Indian Service	24	4,672	1,007	5,686	177,283	2,987
	Indian Service	24	2,211	39	2,250	496,719	2,576
	All Agencies	156	14,704	2,644	14,448	833,429	6,663

(Cont'd.)

Table 3. (Cont'd.) Summary of Local Control by Ownership Classes and Operating Agencies,
North Central Region, 1948

Ownership Class	Operating Agency	Number Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	8-Hour Man-Day ^a Used
			Natural	Planted			
Third Working							
Non-Fed. Public	Bureau-State	11	1,256	1,050	4,551	159,219	1,414
Private	Bureau-State	25	2,223	1/1	6,606	87,552	765
Forest Service	Bureau-State	3	170	500	1,160	188	3
	Forest Service	17	712	2,099	4,456	55,565	1,257
	Total	20	882	2,392	5,616	55,753	1,260
Indian Service	Indian Service	29	4,344	127	7,172	1,065,190	5,122
All Ownership	All Agencies	85	8,705	3,747	23,944	1,567,714	8,362
All Workings							
Non-Fed. Public	Bureau-State	55	9,559	2,322	33,239	365,316	2,953
Private	Bureau-State	31	13,235	1,386	56,076	266,919	2,008
Forest Service	Bureau-State	10	567	460	3,155	1,515	31
	Forest Service	92	8,905	3,485	21,727	481,405	6,957
	Total	102	9,472	3,945	84,882	482,980	6,976
Indian Service	Indian Service	97	13,620	197	23,437	1,724,685	9,642
All Ownership	All Agencies	565	45,286	7,850	130,634	2,819,840	21,622

Table 4. Results of Checking After Pipee Gradication by States and Ownership Classes, North Central Region, 1948

Ownership Class	Checking After Eradication				Classification of Worked Areas on Basis of Ribes F.L.S. per Acre							Percent Acreage Showing FLS or Less per Acre After
	Number of Areas	Acres Worked and Checked	Strip Acres	Ribes Found		Ribes per Acre Bushes F.L.S.	Remaining After Gradication			Over 25.0 FLS Acres		
				Bushes	F.L.S.		0.0-15.0 FLS Acres	15.1-25.0 FLS Acres				
Private	1	108	3.00	4	19.8	1.3	6.6	108	-	-	100.0	
Private	5	383	7.00	0	0.0	0.0	0.0	383	-	-	100.0	
Non-Fed. Public	5	334	6.70	78	145.0	11.6	21.6	200	134	-	100.0	
Private	10	171	4.00	60	86.0	15.0	21.5	91	80	-	100.0	
Total	15	505	10.70	138	231.0	12.9	21.6	291	214	-	100.0	
Non-Fed. Public	5	1,804	9.80	23	73.0	2.3	7.4	1,804	-	-	100.0	
Private	34	3,486	34.80	35	175.0	1.0	5.0	3,322	75	89	97.4	
Total	39	5,290	44.60	58	248.0	1.3	5.6	5,126	75	89	98.3	
Non-Fed. Public	18	5,469	209.40	56	202.0	0.3	1.0	5,469	-	-	100.0	
Private	53	11,505	256.80	419	725.5	1.6	2.8	11,115	390	-	100.0	
Forest Service	55	12,261	220.90	254	457.5	1.1	2.1	11,971	290	-	100.0	
Total	126	29,235	687.10	729	1,385.0	1.1	2.0	28,555	680	-	100.0	
Non-Fed. Public	3	550	16.82	42	58.0	2.5	3.4	550	-	-	100.0	
Private	6	669	15.06	126	97.8	8.4	6.5	634	-	35	94.8	
Forest Service	27	4,552	109.79	217	654.3	2.0	6.0	4,109	120	323	92.9	
Indian Service	15	3,413	46.16	477	567.5	10.3	12.3	2,583	584	246	92.8	
Total	51	9,184	187.83	862	1,377.6	4.6	7.3	7,876	704	604	93.4	

Table 4. Results of Checking After Ribes Tradication by States and Ownership Classes,
North Central Region, 1948 (Cont'd.)

Ownership Class	Number of Areas	Checking After Tradication				Classification of Worked Areas on Basis of Ribes F.L.S. per Acre				Percent Areas Showing FLS or Less After	
		Acres		Ribes Found		Ribes per Acre		Remaining After Tradication			
		Worked	and Checked	Strip Acres	Ribes Bushes	F.L.S.	Ribes Bushes	F.L.S.	0.0-15.0 FLS		
									Acres		Acres
Non-Fed. Public	17	23,057	162.40	664	2,235.2	4.1	13.8	22,383	674	109.0	
Private	5	9,611	107.00	68	332.0	0.6	3.1	9,611	-	100.0	
Forest Service	18	7,576	175.20	384	1,043.1	2.2	6.0	7,576	-	100.0	
Indian Service	27	9,421	160.20	615	996.6	3.8	6.2	9,351	70	100.0	
Total	67	49,665	604.80	1,741	4,606.9	2.9	7.6	48,921	744	100.0	
Wisconsin											
Non-Fed. Public	48	31,214	405.12	863	2,713.2	2.1	6.7	30,406	808	100.0	
Private	114	25,933	427.66	712	1,436.1	1.7	3.4	25,264	545	100.0	
Forest Service	100	24,389	505.39	865	2,154.9	1.7	4.3	23,656	410	100.0	
Indian Service	42	12,834	206.36	1,092	1,564.1	5.3	7.6	11,934	654	100.0	
Region Total	304	94,370	1,545.03	3,532	7,868.3	2.3	5.1	91,260	2,417	100.0	

Note: There were 565 areas with 137,634 acres worked in 1948. The 261 areas with 43,264 acres not included as checked in Table 4 were mostly given an administrative, but not quantitative check after working and found satisfactory, or else were found to be ribes-free areas, not requiring checking.

Table 5. Control Area Permits, North Central Region, 1948

State	Season 1948	Number Applications Received	Number Control Area Permits Approved	Number Applications		Percent Applications Approved	Applications Man-Days Used
				Rejected	Voluntarily Cancelled by Applicant		
Michigan	Spring		190	7	42	79.5	6.0
	Spring	138	119	1	18	86.2	13.0
	Fall	19	17	0	2	89.5	2.0
	Total	157	136	7	20		
Ohio	Spring	36	22	4	10	86.6	15.0
	Fall	5	4	1	0	61.1	0.5
	Total	41	26	5	10	80.0	0.5
Wisconsin	Spring	315	299	14	2	63.4	1.0
	Fall	33	33	0	0	94.9	5.5
	Total	348	332	14	2	100.0	0.5
Region	Spring	728	630	26	72	35.4	6.0
	Fall	57	54	1	2	86.5	27.0
Region Total		785	684	27	74	94.7	3.0
						87.2	30.0

Tables 6 and 7. Status of Control by States and Ownership Classes,
North Central Region, December 31, 1948
Net Acres

Ownership Class	Acres Total Control Problem				Acres Initially Worked				Acres Not Initially Worked		Acres on Maintenance	
	Natural		Total		Natural		Total		White Pine	Control Area	White Pine	Control Area
	White pine	White Pine	White Pine	White Pine	White Pine	White Pine	White Pine	White Pine				
Illinois												
Non-Fed. Public	197	914	1,111	6,326	912	1,104	6,212	7	114	542	1,100	
Private	34	798	832	7,168	742	776	5,053	56	2,115	58	1,149	
Total	231	1,712	1,943	13,494	1,654	1,880	11,265	63	2,229	601	2,249	
Indiana												
Forest Service	-	18	18	179	18	18	179	-	-	18	179	
Non-Fed. Public	99	2,388	2,487	17,909	2,335	2,434	16,573	52	1,346	1,537	11,569	
Private	227	6,077	6,304	170,294	4,391	4,618	59,687	1,687	110,597	3,501	40,761	
Total	326	8,465	8,791	188,382	6,726	7,052	76,260	1,739	111,943	5,038	52,340	
Iowa												
Indian Service	-	45	45	500	45	45	500	-	-	-	-	
Non-Fed. Public	348	211	559	3,408	210	558	3,388	1	20	11	50	
Private	366	4,882	5,248	46,133	2,474	2,790	30,345	2,458	15,788	1,590	18,793	
Total	714	5,138	5,852	50,041	2,729	3,393	34,233	2,459	15,808	1,601	18,843	
Ohio												
Forest Service	-	520	520	4,341	514	514	4,029	6	312	514	4,069	
Non-Fed. Public	797	5,866	6,663	55,719	4,192	4,988	40,139	1,675	15,580	1,345	13,591	
Private	2,287	10,950	13,237	406,754	6,748	8,922	138,864	4,315	267,890	3,116	62,111	
Total	3,084	17,336	20,420	466,814	11,454	13,424	183,032	5,996	283,782	5,005	80,810	
Michigan												
Forest Service	25,916	32,754	58,670	156,288	32,573	57,871	153,813	779	2,475	35,519	106,739	
Nat. Park Service	15	-	15	120	-	15	120	-	-	-	-	
Non-Fed. Public	97,998	30,714	128,712	309,831	29,526	159,945	291,186	1,787	16,705	54,245	128,601	
Private	124,265	13,576	207,841	716,869	11,357	188,675	650,126	25,166	96,713	52,001	192,940	
Total	2,019	77,011	395,231	1,183,100	41,651	131,926	1,065,185	70,312	111,923	112,525	428,511	

Tables 6 and 7. (Cont'd.) Status of Control by State and Ownership Classes,
North Central Region, December 31, 1948
Net Acres

Ownership Class	Acres Total Control Problem				Acres Initially Worked				Acres Not Initially Worked		Acres On Maintenance	
	Natural Planted		Total		Natural Planted		Total		Initially Worked		Initially Worked	
	White Pine	White Pine	White Pine	Control Area	White Pine	White Pine	White Pine	Control Area	White Pine	White Pine	White Pine	Control Area
Minnesota												
Forest Service	92,539	5,688	98,227	161,414	33,499	5,688	39,187	60,657	59,040	100,757	10,129	17,606
Indian Service	21,306	384	21,690	32,725	21,286	384	21,670	32,682	20	43	12,738	17,957
Non-Fed. Public	46,877	7,322	54,199	114,003	32,711	5,738	38,449	75,449	15,750	38,554	12,819	24,565
Private	84,817	383	85,200	271,426	66,312	381	66,693	205,813	18,507	65,613	14,967	36,201
Total	245,539	13,777	259,316	579,568	153,808	12,191	165,999	374,601	93,317	204,981	50,653	95,329
Wisconsin												
Forest Service	21,608	11,125	32,733	65,544	20,474	10,788	31,262	57,603	1,471	7,941	11,596	22,100
Indian Service	49,803	758	50,561	91,828	45,244	757	46,001	81,166	4,560	10,662	22,179	40,105
Non-Fed. Public	80,111	16,023	96,134	270,333	78,762	15,621	94,383	267,967	1,751	2,366	45,802	131,105
Private	252,116	8,365	260,481	1,028,014	203,804	6,907	210,711	769,684	49,770	258,350	86,110	291,866
Total	403,638	36,271	439,909	1,455,719	348,284	34,073	382,357	1,176,400	57,552	279,319	165,687	485,171
Region												
Forest Service	140,063	50,105	190,168	387,766	79,291	49,581	128,872	276,281	61,296	111,485	57,776	150,572
Indian Service	71,109	1,187	72,296	125,053	66,530	1,186	67,716	114,348	4,580	10,705	34,917	57,961
Nat. Park Service	15	-	15	120	15	-	15	120	-	-	-	-
Non-Fed. Public	226,427	63,438	289,865	777,529	207,327	58,534	265,861	700,854	24,003	76,685	116,302	310,532
Private	534,112	45,031	579,143	2,646,658	444,185	33,000	477,185	1,829,552	101,959	817,096	162,173	644,123
Region Total	971,726	159,761	1,131,487	3,937,126	797,348	112,301	909,649	2,921,153	191,838	2,015,971	371,163	1,163,171

Table 8. Summary of Local Control by States, Workings, and Ownership Classes,
From Inception to December 31, 1948 - North Central Region
Gross Acres

State	Ownership Class	Acres White Protected	Acres Pine Protected	Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days	Average per Acre Worked		Average Ribes Destroyed Per Man-Day
							Ribes	Man-Days	
Initial Working									
Illinois 1932-1948	Forest Service	1	50	-	-	-	-	-	-
	Non-Federal Public	2,555	8,636	1,139,265	2,843	13.2	0.33	401	
	Private	776	11,344	360,297	1,028	31.8	0.09	350	
	Total	3,332	20,030	1,499,562	3,871	74.9	0.42	381	
Indiana 1933-1948	Forest Service	18	179	-	3	-	0.02	-	
	Non-Federal Public	2,059	17,052	107,667	942	6.3	0.06	114	
	Private	6,578	70,702	328,910	2,962	4.7	0.04	111	
	Total	8,655	87,933	436,577	3,907	5.0	0.04	112	
Iowa 1933-1948	Indian Service	45	500	13,482	169	26.9	0.34	80	
	Non-Federal Public	605	4,031	636,996	5,928	158.0	1.47	107	
	Private	2,747	34,373	2,902,263	21,062	84.4	0.61	138	
	Total	3,397	38,904	3,542,721	27,159	91.3	0.70	151	
Ohio 1933-1948	Forest Service	544	4,029	56	13	Trace	0.01	4	
	Non-Federal Public	4,282	40,569	510,668	8,258	12.6	0.20	62	
	Private	10,979	161,682	2,036,611	24,637	12.6	0.15	83	
	Total	15,775	206,280	2,547,355	32,908	12.3	0.16	79	
Michigan 1928-1948	Forest Service	58,674	162,606	6,000,668	31,268	36.9	0.19	192	
	National Park Service	15	120	13	-	0.1	0.00	-	
	Non-Federal Public	137,360	415,720	21,036,945	89,503	50.6	0.21	235	
	Private	237,955	736,969	38,305,055	159,002	52.0	0.22	241	
Total	434,004	1,315,415	65,342,681	279,773	49.7	0.22	209		
Minnesota 1917-1948	Forest Service	42,112	81,537	9,357,869	41,954	114.8	0.51	221	
	Indian Service	21,783	33,877	10,550,404	20,191	311.4	0.60	523	
	Non-Federal Public	40,565	86,308	10,803,313	39,504	125.2	0.46	273	
	Private	70,267	219,761	31,103,529	63,830	141.5	0.29	457	
Total	144,727	481,485	60,815,115	165,479	146.7	0.39	374		

(Continued)

Table 8. (Cont'd.) Summary of Local Control by States, Workings and Ownership Classes
From Inception to December 31, 1948 - North Central Region
Gross Acres

State	Ownership Class	Acres White Pine Protected	Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days	Average Per		Average No Ribes Destroyed per Man-Day
						Ribes	Acre Worked Man-Days	
Wisconsin 1920-1948	Forest Service	29,151	68,908	4,934,105	30,951	71.6	0.45	160
	Indian Service	47,759	87,454	20,673,703	67,958	236.4	0.78	304
	Non-Federal Public	98,172	289,708	11,407,404	48,198	39.4	0.17	237
	Private	224,382	848,584	50,337,067	218,339	59.3	0.26	231
	Total	399,464	1,294,654	87,352,279	365,446	67.5	0.28	232
Region 1917-1948	Forest Service	130,470	317,309	20,292,698	104,189	64.0	0.33	195
	Indian Service	69,587	121,831	31,237,569	88,318	256.4	0.72	354
	National Park Service	15	120	13	-	Trace	-	-
	Non-Federal Public	285,598	862,024	45,642,253	195,176	52.9	0.23	234
	Private	553,684	2,083,415	125,373,732	490,860	60.2	0.24	255
Region Total, Initial		1,039,354	3,384,699	222,546,270	878,543	65.8	0.26	253
Illinois 1936-1948	Non-Federal Public	1,903	7,104	560,537	2,150	78.9	0.30	261
	Private	382	3,079	49,505	362	16.1	0.12	137
	Total	2,285	10,183	610,042	2,512	59.9	0.25	243
	Non-Federal Public	1,478	7,907	17,667	226	2.2	0.03	78
	Private	2,148	12,278	74,512	810	6.1	0.07	92
Iowa 1936-1948	Non-Federal Public	3,626	20,185	92,179	1,036	4.6	0.05	89
	Private	10	206	3,592	57	17.4	0.28	63
	Total	3,636	20,391	95,771	1,093	158.3	1.09	146
	Non-Federal Public	328	2,078	328,966	2,256	66.2	0.56	117
	Private	712	4,991	330,497	2,813	91.1	0.79	129
Ohio 1936-1948	Non-Federal Public	1,050	7,275	663,055	5,126	16.7	0.38	45
	Private	2,185	19,290	323,059	7,252	14.2	0.18	78
	Total	3,235	26,565	986,114	12,378	15.3	0.26	53
	Non-Federal Public	328	2,078	328,966	2,256	66.2	0.56	117
	Private	712	4,991	330,497	2,813	91.1	0.79	129

(Cont'd.)

Table 8. (Cont'd.) Summary of Local Control by States, Workings and Ownership Classes
From Inception to December 31, 1948 - North Central Region
Gross Acres

State	Ownership Class	Acres		Number of Ribes Destroyed	Total 8-Hour Man-Days	Average Per Acre Worked		Average No. Ribes Destroyed Per Man-Day	
		White Pine Protected	Acres Worked			Ribes	Man-Days		
Second Working (Cont'd.)									
Michigan 1932-1948	Forest Service	26,118	61,310	1,087,787	10,437	17.7	0.17	104	
	Non-Federal Public	41,754	111,040	2,401,938	15,347	21.6	0.14	156	
	Private	86,410	246,082	4,676,356	28,859	19.0	0.12	162	
	Total	154,282	418,432	8,166,081	54,643	19.5	0.13	149	
Minnesota 1933-1947	Forest Service	16,387	26,179	1,450,825	11,677	55.4	0.45	124	
	Indian Service	17,685	25,107	2,557,161	11,501	101.9	0.46	222	
	Non-Federal Public	13,172	21,412	1,197,112	7,658	55.9	0.36	156	
	Private	14,038	45,916	2,707,910	11,570	59.0	0.25	234	
Total	61,282	118,614	7,913,008	42,406	66.7	0.36	187		
Wisconsin 1934-1948	Forest Service	26,214	47,093	1,021,233	12,690	21.7	0.27	80	
	Indian Service	18,529	36,292	3,346,959	21,782	92.2	0.60	154	
	Non-Federal Public	36,265	85,368	1,234,094	10,244	14.5	0.12	120	
	Private	67,030	229,919	3,558,772	30,450	15.5	0.13	117	
Total	148,038	398,672	9,161,058	75,166	23.0	0.19	122		
Region 1932-1948	Forest Service	68,719	134,582	3,559,845	34,804	26.5	0.26	102	
	Indian Service	36,224	61,605	5,907,712	33,340	95.9	0.54	177	
	Non-Federal Public	97,085	254,199	6,063,373	45,133	23.9	0.18	134	
	Private	173,982	570,336	11,797,017	80,017	20.7	0.14	147	
Region Total, Second		376,010	1,020,722	27,327,947	193,294	26.8	0.19	144	
Third and Other Workings									
Illinois 1940-1948	Non-Federal Public	1,904	7,669	458,360	2,868	59.8	0.37	160	
	Private	852	4,953	75,636	641	15.3	0.13	118	
	Total	2,756	12,622	533,996	3,509	45.3	0.28	152	

Table 8. (Cont'd.) Summary of Local Control by States, Workings, and Ownership Classes,
From Inception to December 31, 1948 - North Central Region
Gross Acres

State	Ownership Class	Acres		Number of Ribes Destroyed	Total 8-Hour Man-Days	Average Per Acre Worked		Average No. Ribes Destroyed Per Man-Day
		White Pine Protected	Pine Acres Worked			Ribes	Man-Days	
Third and Other Workings (Cont'd.)								
Indiana 1941-1948	Non-Federal Public	611	3,190	14,784	212	4.6	0.07	70
	Private	247	2,780	10,209	52	3.7	0.02	196
	Total	858	5,970	24,993	264	4.2	0.04	95
Iowa 1940-1948	Non-Federal Public	276	934	92,821	908	99.4	0.97	102
	Private	31	363	22,935	209	63.2	0.58	110
	Total	307	1,297	115,756	1,117	69.2	0.86	104
Ohio 1940-1948	Non-Federal Public	1,231	3,762	6,137	280	1.6	0.07	22
	Private	1,763	10,594	163,901	2,136	15.5	0.20	77
	Total	2,994	14,356	170,038	2,416	11.8	0.17	70
Michigan 1937-1948	Forest Service	8,106	18,136	148,861	2,642	8.2	0.15	56
	Non-Federal Public	9,115	21,309	276,480	2,211	13.0	0.10	125
	Private	15,521	45,561	660,289	5,434	14.5	0.12	122
Minnesota 1937-1948	Total	32,742	85,006	1,085,630	10,287	12.8	0.12	106
	Forest Service	6,414	11,003	358,350	3,631	32.6	0.33	99
	Indian Service	11,314	16,196	1,601,181	8,985	98.9	0.55	178
Wisconsin 1938-1948	Non-Federal Public	4,268	5,378	296,874	2,064	55.2	0.38	144
	Private	540	1,539	104,366	662	67.8	0.43	158
	Total	22,536	34,116	2,360,771	15,342	69.2	0.45	154
Region 1938-1948	Forest Service	2,633	4,114	71,439	1,597	17.2	0.39	45
	Indian Service	5,344	10,028	690,667	5,240	68.9	0.52	132
	Non-Federal Public	3,292	6,455	264,866	2,526	41.0	0.39	105
Region	Private	5,252	15,934	124,341	1,048	7.8	0.07	119
	Total	16,521	36,561	1,151,313	10,411	31.5	0.26	111
	Forest Service	17,153	33,283	578,650	7,870	17.4	0.24	74
Region Total, Third and Other Workings	Indian Service	16,658	26,224	2,291,848	14,225	87.4	0.54	161
	Non-Federal Public	20,697	48,697	1,410,322	11,069	29.0	0.23	127
	Private	24,206	81,724	1,161,677	10,182	14.2	0.12	114
		78,714	189,928	5,442,497	43,346	28.7	0.23	126

(Cont'd.)

Table 8. (Cont'd.) Summary of Local Control by States, Workings and Ownership Classes,
From Inception to December 31, 1948 - North Central Region
Gross Acres

State	Ownership Class	Acres White Pine Protected	Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days	Average Per		Average Ribes Destroyed Per Man-Day
						Ribes	Acres Worked	
All Workings								
Illinois 1932-1948	Forest Service	1	50	-	-	-	-	-
	Non-Federal Public	6,362	23,409	2,158,162	7,861	92.2	0.34	275
	Private	2,010	19,376	485,438	2,031	6.1	0.10	239
	Total	8,372	42,835	2,643,600	9,892	61.7	0.23	251
Indiana 1933-1948	Forest Service	18	179	-	3	-	0.02	-
	Non-Federal Public	4,148	28,149	140,118	1,380	5.0	0.04	102
	Private	8,973	85,760	413,631	3,824	4.8	0.04	108
	Total	13,139	114,088	553,749	5,207	4.9	0.04	106
Iowa 1933-1948	Indian Service	55	706	17,054	226	24.2	0.32	75
	Non-Federal Public	1,209	7,043	1,058,783	9,092	150.3	1.29	116
	Private	3,490	39,727	3,255,695	24,084	82.0	0.61	135
	Total	4,754	47,476	4,331,532	33,402	91.2	0.70	130
Ohio 1933-1948	Forest Service	514	4,029	56	13	Trace	0.01	4
	Non-Federal Public	7,698	63,621	839,864	15,790	13.2	0.25	53
	Private	16,004	200,347	2,599,977	31,926	13.0	0.16	81
	Total	24,216	267,997	3,439,897	47,729	12.8	0.18	72
Michigan 1928-1948	Forest Service	92,898	242,052	7,237,316	44,347	29.9	0.18	161
	National Park Service	15	120	13	-	0.1	-	-
	Non-Federal Public	188,229	548,069	23,715,363	107,061	43.3	0.19	222
	Private	339,886	1,028,612	43,641,700	193,295	42.4	0.19	226
Total	631,028	1,810,953	74,594,392	244,703	41.0	0.19	216	
Minnesota 1917-1948	Forest Service	64,913	118,719	11,167,044	57,262	94.0	0.48	195
	Indian Service	50,782	75,180	14,708,746	40,677	196.6	0.54	361
	Non-Federal Public	58,005	113,098	12,297,299	49,226	108.7	0.44	250
	Private	84,845	267,216	33,915,805	76,062	126.9	0.28	446
Total	258,545	574,214	72,088,894	223,827	125.5	0.39	322	

(Cont'd.)

Table 8. (Cont'd.) Summary of Local Control by States, Workings and Ownership Classes
From Inception to December 31, 1948 - North Central Region
Gross Acres

State	Ownership Class	Acres		Number of Ribes Destroyed	Total 8-Hour Man-Days	Average Per Acre Worked		Average No. Ribes Destroyed Per Man-Day
		White Pine Protected	Acres Worked			Ribes	Man-Days	
All Workings (Cont'd.)								
Wisconsin 1920-1948	Forest Service	57,998	120,145	6,026,777	45,238	50.2	0.38	133
	Indian Service	71,632	133,774	24,711,329	94,980	184.7	0.71	260
	Non-Federal Public	137,729	381,531	12,906,364	60,968	33.8	0.16	212
	Private	296,664	1,094,437	54,020,180	249,837	49.4	0.23	216
	Total	564,023	1,729,887	97,664,650	451,023	56.5	0.26	217
Region 1917-1948	Forest Service	216,342	485,174	24,431,193	146,863	50.4	0.30	166
	Indian Service	122,469	209,660	39,437,129	135,883	188.1	0.65	290
	National Park Service	15	120	13	-	0.1	-	-
	Non-Federal Public	403,380	1,164,920	53,115,953	251,378	45.6	0.22	211
	Private	751,872	2,735,475	138,332,426	581,059	50.6	0.21	238
Region total, All Workings		1,494,078	4,595,349	255,316,714	1,115,183	55.6	0.24	229

Table 8A. Summary of Ribes Fradication, All Workings, by States, Ownership Classes, and Operating Agencies, 1917 to 1948 - North Central Region
Gross Acres

Ownership Class	Operating Agency	Gross Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days Used	Average Per		Average No. Ribes Destroyed Per Man-Day
					Ribes	Acro Worked	
					Man-Days		
Illinois							
Forest Service	Bureau-State	50					
Non-Federal Public	Bureau-State	23,409	2,153,162	7,861	92.2	0.34	275
Private	Bureau-State	19,375	485,438	2,031	25.1	0.10	239
Total, State		42,835	2,643,600	9,892	61.7	0.23	267
Indiana							
Forest Service	Bureau-State	179					
Non-Federal Public	Bureau-State	28,149	340,118	1,380	5.0	0.05	102
Private	Bureau-State	85,760	423,631	3,624	4.8	0.04	108
Total, State		114,088	553,749	5,004	4.9	0.05	105
Iowa							
Indian Service	Indian Service	706	17,054	225	24.2	0.32	75
Non-Federal Public	Bureau-State	7,043	2,058,783	9,092	230.3	1.29	172
Private	Bureau-State	39,721	3,255,695	24,081	82.0	0.61	135
Total, State		47,470	4,332,532	33,402	92.2	0.70	130
Ohio							
Forest Service	Bureau-State	4,029	56	13	71.08	0.028	4
Non-Federal Public	Bureau-State	63,821	822,001	15,790	13.2	0.05	52
Private	Bureau-State	200,217	2,529,977	11,226	23.9	0.16	81
Total, State		267,997	3,439,897	47,729	32.0	0.18	72

Table 8A. (Cont'd.) Summary of Ribes eradication, All Workings, by States, Ownership Classes, and Operating Agencies, 1917 to 1948 - North Central Region
Gross Acres

Ownership Class	Operating Agency	Gross Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days Used	Average Per		Average No. Ribes Destroyed Per Man-Day
					Ribes	Man-Days	
Forest Service	Bureau-State	72,650	823,570	3,726	11.3	0.05	221
	Bureau-Intermingled	1,538	85,396	433	55.5	0.28	197
	Forest Service	167,864	6,328,350	40,188	37.7	0.24	157
	Sub-Total	242,052	7,237,316	44,347	29.9	0.18	163
	Bureau-State	120	13		0.1		
National Park Service	Bureau-State	548,069	23,715,363	107,061	43.3	0.20	222
	Bureau-State	1,005,925	43,395,681	191,746	43.1	0.19	226
	Bureau-Intermingled	21,842	238,517	1,524	10.9	0.07	157
	Forest Service	845	7,502	25	8.9	0.03	300
	Sub-Total	1,028,612	43,641,709	193,225	42.4	0.19	226
Total, State		1,818,853	74,594,392	344,703	41.0	0.19	216
Minnesota							
Forest Service	Bureau-State	20,855	2,415,503	7,125	115.8	0.34	339
	Forest Service	97,864	8,751,541	50,137	89.4	0.51	175
	Sub-Total	118,719	11,167,044	57,262	94.9	0.48	195
	Bureau-State	3,289	349,469	1,179	106.3	0.36	296
	Indian Service	71,891	14,359,277	39,498	199.7	0.55	364
Non-Federal Public	Sub-Total	75,180	14,708,746	40,677	195.6	0.54	362
	Bureau-State	111,411	12,109,808	46,985	108.7	0.42	258
	Bureau-Intermingled	1,687	187,491	2,241	111.1	1.33	84
	Sub-Total	113,098	12,297,299	49,226	108.7	0.44	250
	Bureau-State	267,216	33,915,805	76,062	126.9	0.28	446
Total, State		514,213	72,038,894	223,227	125.5	0.39	323

(Cont'd.)

Table 8A. (Cont'd.) Summary of Ribes Fradication, All Workings, by states, Ownership Classes, and Operating Agencies, 1917 to 1948 - North Central Region
Gross Acres

Ownership Class	Operating Agency	Gross Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days Used	Average Per		Average No. Ribes Destroyed Per Man-Day
					Ribes	Man-Days	
Wisconsin							
Forest Service	Bureau-State	19,556	503,553	2,994	25.7	0.15	168
	Bureau Intermingled	9,726	169,426	2,327	17.4	0.24	73
	Forest Service	90,863	5,353,798	39,917	58.9	0.44	134
	Sub-Total	120,145	6,026,777	45,238	50.2	0.30	133
Indian Service	Indian Service	133,774	24,711,329	94,980	184.7	0.72	263
	Bureau-State	380,774	12,893,219	60,766	33.9	0.16	212
	Bureau-Intermingled	757	13,145	202	17.4	0.27	65
	Sub-Total	381,531	12,906,364	60,968	33.8	0.16	212
Private	Bureau-State	1,093,635	54,004,635	249,616	49.4	0.23	216
	Bureau-Intermingled	802	15,545	221	19.4	0.28	70
	Sub-Total	1,094,437	54,020,180	249,837	49.4	0.23	216
	Total, State	1,729,887	91,641,650	451,023	56.5	0.26	217
Region							
Forest Service	Bureau-State	117,319	3,742,682	13,861	31.9	0.12	270
	Bureau-Intermingled	11,264	254,822	2,760	22.6	0.25	92
	Forest Service	356,591	20,433,689	130,242	57.3	0.37	157
	Sub-Total	485,174	24,431,193	146,863	50.4	0.30	156
Indian Service	Bureau-State	3,289	349,469	1,179	106.3	0.36	296
	Indian Service	206,371	39,087,660	134,704	189.4	0.65	290
	Sub-Total	209,660	39,437,129	135,883	186.4	0.65	290
	National Park Service Bureau-State	12	13	1	0.4		

(cont'd.)

Table 8A. (Cont'd.) Summary of Ribes Eradication. All Workings, by States, Ownership Classes, and Operating Agencies, 1917 to 1948 - North Central Region
Gross Acres

Ownership Class	Operating Agency	Gross Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days Used	Average Per		Average No. Ribes Destroyed per Man-Day
					Acre	Man-Days	
					Ribes	Worked	
Region (Cont'd.)							
Non-Federal Public	Bureau-State	1,162,476	52,915,317	248,935	45.5	0.21	213
	Bureau-Intermingled	2,444	200,636	2,443	82.1	1.00	82
Private	Sub-Total	1,164,920	53,115,953	251,378	45.6	0.22	211
	Bureau-State	2,711,986	138,070,862	579,289	50.9	0.21	238
	Bureau-Intermingled	22,644	254,062	1,745	11.2	0.08	146
	Forest Service	845	7,502	25	8.9	0.03	300
	Sub-Total	2,735,475	138,322,126	581,059	50.6	0.21	238
Grand Total, Region		4,595,349	255,316,714	1,115,183	55.6	0.24	229

Table 9. Summary of Nursery Sanitation, North Central Region, 1948

Name and Ownership of Nursery	Operating Agency	Working	White Pine		Acres Protected	Acres Worked	Ribes		Man- Days Used
			Trees In Nurseries	Destroyed			Cult.	Wild	
<u>Ohio</u>									
Green Springs Nursery, Ohio	Bureau-State	First	1,000*	20	155	1	1,050	27	
<u>Wisconsin</u>									
Clark County Nursery, County	Bureau-State	Fourth	163,458	4	96	-	34	36	
Gordon Nursery, State	Bureau-State	Eighth	2,267,000	4	373	-	303	25	
Hayward Nursery, State	Bureau-State	Seventh	2,495,000	5	502	-	402	17	
<u>Total, State</u>			4,925,458	13	971	-	739	78	
<u>Total, Region</u>			4,925,458	22	1,155	1	1,789	98	

* Seeding for 3,000,000 White Pine Trees expected to be made in spring, 1949.

Table 10. Cultivated Black Current Elimination, North Central Region, 1948

State	Found		Destroyed		Man-Days Used
	Plantings	Plants	Plantings	Plants	
Iowa	4	56	14	94	5
Michigan	1	4	1	4	21
<u>Total, Region</u>	5	60	15	98	26

Table 11. Cumulative Calculated Black Current Elimination,
North Central Region, to December 31, 1948

State	Number of Inspections	Found		Destroyed		Total Man-Days Used	Plantings Found per 1,000 Inspections
		Plantings	Plants	Plantings	Plants		
Illinois	48,067	532	4,171	60	761	*	11.1
Indiana	64,226	5	20	3	15	*	0.2
Iowa	318,600	1,610	7,330	1,601	7,298	6,530	5.1
Ohio	1,845,970	8,938	75,605	8,406	73,117	25,791	4.8
Michigan	980,875	14,928	147,843	14,861	147,189	40,113	15.2
Minnesota	211,664	3,261	23,309	3,261	23,309	12,001	15.4
Wisconsin	922,898	6,601	37,080	6,597	37,051	32,137	7.2
Region Total	4,392,300	35,775	295,358	34,789	288,740	16,572	8.8

* Work done in connection with other field activities.

Table 12. Federal Expenditures, Milwaukee Regional Office, Calendar Year, 1948
(All Expenditures for Leadership and Coordination)

Appropriation	Expenditure Class	Amount
3101.14 January to June, 1948	Salaries	\$24,071.85
	Non-Salaries	1,714.07
	Total	25,785.92
71.14 July to December, 1948	Salaries	15,209.12
	Non-Salaries	1,519.75
	Total	16,728.87
3101.14 January to June, 1947	Salaries	-
	Non-Salaries	4.85
	Total	4.85
Total	Salaries	29,280.97
	Non-Salaries	3,238.67
Grand Total		32,519.64

Table 12 A. North Central Region Expenditures, by State and Appropriation, Calendar year 1943

Appropriation	Milwaukee						Total Region
	Illinois	Indiana	Iowa	Ohio	Michigan	Minnesota	
State Indirect Aid January to June	\$300.00	\$270.00	\$450.00	\$402.00	\$750.00	\$1,400.00	\$7,372.00
State Indirect Aid July to December	210.00	300.00	450.00	402.00	675.00	1,400.00	7,237.00
State Direct Aid January to June	1,913.36	67.20	177.55	182.00	5,759.64	3,810.95	19,761.70
State Direct Aid July to December	2,199.69	1,284.96	515.13	994.16	5,391.52	9,761.10	36,093.00
Bureau 3101.14	501.49	501.49	1,197.48	1,994.16	8,233.63	9,784.93	70,169.82
January to June	773.26	773.26	773.26	1,997.93	8,455.14	9,854.77	16,728.87
July to December	487.93	335.72	2,305.85	2,588.91	3,773.98	1,571.75	16,012.49
Bureau 3103.15	24.35	83.54	3,159.18	2,620.63	4,923.99	3,424.49	20,288.04
January to June	-	-	-	-	13,173.79	29,191.67	52,129.14
July to December	-	-	-	-	3,923.29	43,279.55	57,968.15
Bureau 3107.16	-	-	-	-	-	23,576.01	39,682.77
January to June	-	-	-	-	-	22,077.03	37,997.51
July to December	-	-	-	-	-	15,860.50	3,572.70
Bureau 3108.17	-	-	-	-	-	3,400.00	3,600.00
January to June	-	-	-	-	-	-	-
July to December	-	-	-	-	-	-	-

Table 12A. (Cont'd) North Central Region Expenditures, by State and Appropriation, Calendar year 1948

Appropriation	Illinois	Indiana	Iowa	Ohio	Michigan	Minnesota	Wisconsin	Milwaukee	
								Office	Total Region
Subtotal, All Funds January to June	3,800.73	1,174.44	4,140.38	5,067.07	31,691.04	69,331.91	54,954.46	15,790.77	185,358.43
Subtotal, All Funds July to December	3,207.30	2,441.76	4,597.57	6,044.72	23,369.24	89,795.94	64,309.94	16,728.87	210,709.36
Grand Total	7,008.03	3,616.20	8,737.95	11,111.79	55,060.28	159,127.85	119,264.40	32,519.64	396,067.79

- a - Includes \$124.36 Salary of 3103.14 F.Y. 1946 funds, not previously reported
b - Includes non-salary items of F.Y. 1947 funds of \$4.31 of 3103.14 and \$41.86 of 3103.14 Intermingled funds, not previously reported.
c - Includes \$1,044.95 spent on Survey in 1947, not previously reported.
d - Includes non-salary item of \$4.85 of 3101.14, F.Y. 1947 funds not previously reported.

Table 12B. Total North Central Region Expenditures, Classified by State and Activity,
Calendar Year 1948

Activity	Illinois	Indiana	Iowa	Ohio	Michigan	Minnesota	Wisconsin	Region	Percent Each	
									Activity	Activity
Leadership &										
Coordination(a)	\$4,064.21	\$2,581.72	\$3,396.74	\$6,339.14	\$14,138.01	\$34,809.58	\$32,554.24	\$97,883.64	24.7	
Local Control	18.27	188.30	6,087.51b	4,485.45	33,400.87	108,634.33	85,938.86a	238,753.59	60.3	
Nursery Sanitation	-	-	300.00	321.10	-	400.00	259.37	1,280.47	0.3	
Black Currant	-	-	-	-	-	-	-	-	-	
Elimination	-	-	-	-	336.22	-	-	336.22	0.1	
Canker Pruning	-	-	70.20	-	219.76	3,966.00	67.20	4,323.16	1.1	
Surveys	760.19	1,034.76	-	947.46	1,246.83	16,812.27	4,390.87	25,192.38	6.4	
Other Field Data	1,765.78	-	-	-	10,430.69	10,346.73	5,800.00	28,343.20	7.1	
All Activities(a)	15,628.45	43,804.78	49,094.45	112,695.15	159,772.08	1274,969.92	1129,010.53	2976,217.66	100.0	

a - Includes Milwaukee office costs prorated to States on basis of total Federal Expenditures in each State.

b - Includes \$12.00 as value of cultivated ribes destroyed.

c - Includes \$22.75 as value of cultivated ribes destroyed.

Table 12C. North Central Region Expenditures Classified by Appropriation and Activity, for Calendar Year 1948

Source of Funds	Class of Expenditures	Leadership and Co-ordination	Local Control	Nursery Sanitation	Black Current Elimination	Canker Pruning	Surveys	Other Field Data	Total	Percent Each Source of Funds
State and Private	Salaries	\$13,919.23	\$26,830.18	\$1,041.57	\$202.30	\$1,765.68	\$1,018.63	\$8,480.92	\$53,258.51	
	Non-Salaries	9,468.64	3,825.20	100.00	18.31	92.84	340.27	3,365.85	17,211.11	
	Total	23,387.87	30,655.38	1,141.57	220.61	1,858.52	1,358.90	11,846.77	70,469.62	17.6
Bureau 3101.14 & 71.14	Salaries	66,626.95	7,454.18	75.00	108.08	664.82	2,971.54	7,552.05	85,452.62	
	Non-Salaries	6,864.67	1,010.25	27.30	7.53	54.15	433.45	805.39	9,202.74	
	Total	73,491.62	8,464.43	102.30	115.61	718.97	3,404.99	8,357.44	94,655.36	23.9
Bureau 3103.14 & 73.14	Salaries	910.00	22,756.86	25.80	-	241.07	2,871.70	2,452.15	29,257.58	
	Non-Salaries	94.15	4,723.91	10.80	-	45.76	1,402.37	766.01	7,043.00	
	Total	1,004.15	27,480.77	36.60	-	286.83	4,274.07	3,218.16	36,300.58	9.2
Forest Service 3104 & 74	Salaries	-	85,388.83	-	-	1,435.24	11,414.11	1,169.62	99,407.80	
	Non-Salaries	-	8,015.53	-	-	23.60	2,443.96	203.01	10,686.10	
	Total	-	93,404.35	-	-	1,458.84	13,858.07	1,372.63	110,093.90	27.8
I.S. 3107 and 77 and Tribal	Salaries	-	70,879.74	-	-	-	1,880.40	2,904.04	75,664.18	
	Non-Salaries	-	7,868.91	-	-	-	415.95	644.16	8,929.02	
	Total	-	78,748.65	-	-	-	2,296.35	3,548.20	84,593.20	21.5
Region	Salaries	81,456.18	213,309.79	1,142.37	330.38	4,106.81	20,156.38	22,558.78	343,040.69	
	Non-Salaries	16,427.46	25,443.80	138.10	25.84	216.35	5,036.00	5,784.12	53,071.97	
Region Total		97,883.64	238,753.59	1,280.47	336.22	4,323.16	25,192.38	28,343.20	395,112.66	100.00

Table 13. Approximate Number of Persons Employed by Months and Agencies,
North Central Region, 1948

Operating Agency	Number of Persons by Months												Total
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Illinois													
State & Private	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	12.0
Indiana													
State & Private	-	-	-	-	-	-	-	-	0.1	1.0	1.0	1.0	3.1
Iowa													
State & Private	-	-	-	-	0.3	0.2	0.2	3.1	0.1	-	-	-	3.9
Bureau 71.14	1.0	0.5	-	-	-	-	-	-	-	-	-	-	1.5
Bureau 73.14	1.0	1.0	1.0	1.0	1.0	4.0	5.7	5.2	1.1	1.0	1.0	1.0	24.0
Total	2.0	1.5	1.0	1.0	1.3	4.2	5.9	8.3	1.2	1.0	1.0	1.0	29.4
Ohio													
State & Private	-	-	-	-	0.1	0.4	0.1	5.2	0.3	-	-	-	6.1
Bureau 71.14	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	18.0
Bureau 73.14	2.0	2.0	2.0	2.0	2.0	2.5	3.2	1.8	1.0	1.0	1.0	1.0	21.5
Total	3.0	3.0	3.0	3.0	3.1	3.9	5.3	9.0	3.3	3.0	3.0	3.0	45.6
Michigan													
State & Private	3.0	3.0	3.0	2.5	3.8	7.2	6.1	3.7	2.0	2.0	2.0	2.0	40.3
Bureau 71.14	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	48.0
Bureau 73.14	1.0	1.0	1.0	1.0	3.1	7.9	8.9	5.7	2.8	1.0	1.0	1.0	35.4
F. S. 74	-	-	-	0.5	1.2	51.0	7.8	6.0	-	-	-	-	66.5
Total	8.0	8.0	8.0	8.0	12.1	70.1	26.8	19.1	8.8	7.0	7.0	7.0	150.2
Minnesota													
State & Private	2.0	2.0	2.0	2.0	7.1	21.3	21.0	2.4	3.1	5.5	6.5	2.0	76.9
Bureau 71.14	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	48.0
Bureau 73.14	1.0	-	-	-	-	8.0	5.7	6.1	2.8	2.0	1.7	1.0	28.3

(Cont'd)

Table 13. (Cont'd) Approximate Number of Persons Employed by Months and Agencies,
North Central Region, 1948

Operating Agency	Number of Persons by Months												Total	
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
Minnesota (Cont'd)														
F. S. 74	1.0	2.0	2.0	2.5	18.7	66.4	81.3	76.7	12.3	12.6	3.2	2.6	281.3	2.1
I. S. 77	1.0	0.6	1.1	2.2	37.9	80.0	62.2	59.5	7.4	1.1	1.0	1.2	255.2	2.1
Total	2.0	2.6	3.1	4.7	56.6	146.4	143.5	136.2	19.7	13.7	4.2	3.8	536.5	4.2
Wisconsin														
State & Private	2.3	2.0	2.0	2.0	2.5	10.0	30.5	18.7	7.0	2.0	2.0	2.0	83.1	6.0
Bureau 71.14	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	48.0	4.0
Bureau 73.14	1.0	1.0	1.0	1.0	4.3	12.7	6.8	10.1	3.7	1.0	1.0	1.0	44.6	3.7
F. S. 74	-	-	-	0.4	14.2	24.4	10.3	10.4	16.9	3.0	1.0	1.0	81.6	1.1
I. S. 77	1.0	1.0	1.0	2.5	52.5	40.4	41.0	38.6	24.9	1.0	1.0	1.0	205.9	17.2
Indian Tribal	-	-	-	-	15.0	14.1	11.8	10.0	3.0	-	-	-	53.9	1.1
Total	8.3	8.0	8.0	9.9	92.6	105.6	104.4	91.8	59.5	11.0	9.0	9.0	517.1	43.1
Milwaukee														
Bureau 71.14	7.3	8.0	7.1	7.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	93.9	7.8
Region														
State & Private	8.3	8.0	8.0	7.5	14.9	40.1	58.9	34.3	13.6	11.5	12.5	8.0	225.4	18.8
Bureau 71.14	21.3	21.5	20.1	20.5	21.0	21.0	22.0	22.0	22.0	22.0	22.0	22.0	257.4	21.5
Bureau 73.14	6.0	5.0	5.0	5.0	10.4	35.1	30.3	28.9	11.4	6.0	5.7	5.0	153.8	12.0
F. S. 74	1.0	2.0	2.0	3.4	34.1	141.8	99.4	93.1	29.2	15.6	4.2	3.6	429.4	35.0
I. S. 77	2.0	1.6	2.1	4.7	90.4	120.4	103.2	98.1	32.3	2.1	2.0	2.2	461.1	38.1
Indian Tribal	-	-	-	-	15.0	14.1	11.8	10.0	3.0	-	-	-	53.9	4.9
Region Total	38.6	38.1	37.2	41.1	185.8	372.5	325.6	286.2	111.5	37.2	46.4	40.8	1581.0	131.0

Table 14. Current and Cumulative Summary of Canker Pruning,
to December 31, 1948, North Central Region

State	Years Worked	Number Areas Treated	Number Trees Examined	Number Trees Treated	Number Trees Removed	Number Cankers Removed	Number Man-Days Used
Indiana	1947	2	800	2	0	4	0
	1945-1947	28	26,947	493	619	1,615	37
	1948	7	3,340	58	11	94	6
Iowa	1945-1948	35	30,207	351	630	1,709	43
Ohio	1941-1947	5	1,306	44	13	126	5
	1933-1946	346	776,565	41,476	291	101,468	3,209
	1948	1	2,400	120	0	470	8
Michigan	1933-1948	347	778,965	41,396	291	101,933	3,217
	1933-1947	156	264,056	25,679	1,384	50,301	1,369
	1948	11	73,607	11,521	890	17,635	315
Minnesota	1933-1948	167	337,665	37,200	2,274	67,936	1,601
Wisconsin	1948	1	11,523	561	0	1,102	10
	1933-1947	537	1,069,674	67,694	2,307	153,514	4,630
Region	1948	20	90,870	12,260	901	19,301	339
Region Total	1933-1948	537	1,160,544	79,954	3,203	172,815	4,565

TABLE 1 - SHEET 1

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES - 1948

NORTH CENTRAL REGION

State	Operating Agency	First Working			Second Working			Other Workings							
		Acres Without Ribes	Acres With Ribes	Total Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days			
Illinois	Bureau-State	-	103	103	182	1	-	-	-	-	-	-	-	-	-
Indiana	Bureau-State	-	500	500	43	4	1,093	-	1	125	252	2	-	-	-
Iowa	Bureau-State	-	180	180	24,188	143	236	21,643	136	69	5,669	49	-	-	-
Ohio	Bureau-State	-	1,946	1,946	6,081	34	4,950	2,835	94	233	108	3	-	-	-
Michigan	Bureau-State	-	5,323	5,323	25,917	353	7,022	60,929	395	7,784	27,898	481	-	-	-
	Forest Service	-	3,235	3,235	68,318	488	2,706	20,719	318	3,165	27,304	572	-	-	-
	Total	-	8,558	8,558	94,235	841	9,728	81,648	713	10,949	55,202	1,053	-	-	-
Minnesota	Bureau-State	-	489	489	38,918	151	700	27,906	304	692	61,546	371	-	-	-
	Forest Service	-	3,043	3,043	146,504	1,940	1,076	65,062	821	926	25,620	631	-	-	-
	Indian Service	-	-	-	-	-	2,637	213,946	1,101	4,770	960,718	3,893	-	-	-
	Total	-	3,532	3,532	185,422	2,091	4,413	306,914	2,226	6,388	1,047,884	4,865	-	-	-
Wisconsin	Bureau-State	-	52,103	52,103	132,041	780	6,403	46,308	373	3,394	151,486	1,276	-	-	-
	Forest Service	-	910	910	33,929	288	6,301	91,308	1,845	365	2,641	54	-	-	-
	Indian Service	-	11,943	11,943	172,776	1,944	1,686	282,773	1,475	2,401	104,472	1,229	-	-	-
	Total	-	64,956	64,956	338,746	3,012	14,390	420,389	3,693	6,160	258,599	2,550	-	-	-
All States	Bureau-State	-	60,649	60,649	227,170	1,518	19,504	159,621	1,303	12,317	246,959	2,182	-	-	-
	Forest Service	-	7,188	7,188	248,751	2,716	10,083	177,089	2,984	4,456	55,565	1,257	-	-	-
	Park Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indian Service	-	11,943	11,943	172,776	1,944	4,323	496,719	2,576	7,171	1,065,190	5,128	-	-	-
	O and C	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grand Total		-	77,780	77,780	640,697	6,178	33,910	833,429	6,869	23,944	1,167,714	8,561	-	-	-

TABLE 1 - SHEET 2

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES - 1948

NORTH CENTRAL REGION

ALL WORKINGS

State	Operating Agency	Acres		Total Acres	Ribes Destroyed	Man-Days	Per Acre		Number of Camps	Total Seasonal Employees
		Without Ribes	With Ribes				Ribes	Man-Days		
Illinois	Bureau-State	-	108	108	182	1	1.7	0.01	-	1
Indiana	Bureau-State	-	1,718	1,718	295	7	0.2	0.01	-	1
Iowa	Bureau-State	-	505	505	51,500	330	102.0	0.65	-	9
Ohio	Bureau-State	-	6,229	6,229	8,824	101	1.4	0.03	-	17
Michigan	Bureau-State	-	20,129	20,129	114,744	1,229	5.7	0.61	-	25
	Forest Service	-	9,106	9,106	116,341	1,378	12.8	0.15	-	85
	Total	-	29,235	29,235	231,085	2,607	7.9	0.09	-	110
Minnesota	Bureau-State	-	1,881	1,881	128,370	826	68.0	0.44	-	40
	Forest Service	-	5,045	5,045	237,186	3,392	47.0	0.67	4	149
	Indian Service	-	7,407	7,407	1,174,664	4,994	159.0	0.67	-	128
	Total	-	14,333	14,333	1,540,220	9,212	107.0	0.64	4	325
Wisconsin	Bureau-State	-	61,900	61,900	329,835	2,429	5.3	0.04	-	97
	Forest Service	-	7,576	7,576	127,878	2,187	16.9	0.29	-	31
	Indian Service	-	16,030	16,030	560,021	4,648	34.9	0.29	-	68
	Total	-	85,506	85,506	1,017,734	9,264	11.9	0.11	-	196
ALL States	Bureau-State	-	92,470	92,470	633,750	5,003	6.9	0.54	-	198
	Forest Service	-	21,727	21,727	481,405	6,957	22.2	0.32	4	265
	Indian Service	-	23,437	23,437	1,734,685	9,642	74.0	0.41	-	196
	Grand Total	-	137,634	137,634	2,849,840	21,602	20.7	0.16	4	659

* - Use Peak Season Employment

TABLE 1 - SHEET 4

SUMMARY OF RIBES ERADICATION BY FOREST SERVICE - 1940

NORTH CENTRAL REGION

ALL WORKINGS

National Forests	Acres			Total Acres		Per Acre		Number of Camps	Total Seasonal Employees
	Without Ribes	With Ribes	Total Acres	Ribes Destroyed	Man-Days	Ribes	Man-Days		
Huron, Michigan	-	105	105	11	2	0.1	0.02	-	1
Manistee, Michigan	-	3,815	3,815	23,819	119	6.2	0.03	-	3
Marquette, Michigan	-	500	500	9,899	210	19.8	0.42	-	10
Hiawatha, Michigan	-	2,265	2,265	11,419	188	5.0	0.08	-	7
Ottawa, Michigan	-	2,421	2,421	71,193	859	29.4	0.36	-	64
Superior, Minnesota	-	4,630	4,630	169,736	3,010	37.0	0.65	4	140
Chippewa, Minnesota	-	415	415	67,450	382	169.0	0.92	-	9
Chequamegon, Wisconsin	-	6,681	6,681	108,925	1,883	16.3	0.28	-	23
Nicolet, Wisconsin	-	895	895	18,953	304	21.2	0.34	-	8
Total	-	21,727	21,727	481,405	6,957	22.2	0.32	4	265

* Use Peak Season Employment

TABLE 1 - SHEET 7

SUMMARY OF RIBES ERADICATION BY INDIAN SERVICE - 1948

NORTH CENTRAL REGION											
Indian Lands	First Working					Second Working			Other Workings		
	Acres Without Ribes	Acres With Ribes	Total Acres	Ribes Destroyed	Man- Days	Acres	Ribes Destroyed	Man- Days	Acres Destroyed	Ribes	Man- Days
Grand Portage, Minnesota	-	-	-	-	-	335	135,000	669	225	24,500	164
Red Lake, Minnesota	-	-	-	-	-	2,079	3,112	94	2,861	705,095	2,541
White Earth, Minnesota	-	-	-	-	-	111	68,334	147	375	88,323	198
Nett Lake, Minnesota	-	-	-	-	-	112	7,500	191	1,309	142,800	990
Bad River, Wisconsin	-	1,442	1,442	11,719	118	408	94,256	520	543	87,983	546
Lac Court Oreilles, Wisconsin	-	1,868	1,868	31,321	319	1,278	188,517	955	218	167	8
Lac du Flambeau, Wisconsin	-	5,563	5,563	62,952	547	-	-	-	-	-	-
Menominee, Wisconsin	-	3,070	3,070	66,784	960	-	-	-	1,640	16,322	606
TOTAL	-	11,943	11,943	172,776	1,944	4,323	496,719	2,576	7,171	1,065,199	5,122

TABLE 1 - SHEET 8

SUMMARY OF RIBES ERADICATION BY INDIAN SERVICE - 1948

NORTH CENTRAL REGION

Indian Lands	A l l W o r k i n g s							Number of Camps	Total * Seasonal Employees
	Acres Without Ribes	Acres With Ribes	Total Acres	Ribes Destroyed	Man- Days	Per Acre			
						Ribes	Man- Days		
Grand Portage, Minnesota	-	560	560	159,500	833	285.0	1.49	-	22
Red Lake, Minnesota	-	4,940	4,940	708,207	2,635	143.0	0.53	-	55
White Earth, Minnesota	-	486	486	156,657	345	322.0	0.71	-	15
Nett Lake, Minnesota	-	1,421	1,421	150,300	1,181	106.0	0.83	-	36
Bad River, Wisconsin	-	2,393	2,393	193,958	1,183	81.1	0.49	-	17
Lac Court Oreilles, Wisconsin	-	3,364	3,364	220,005	1,282	65.4	0.38	-	18
Lac du Flambeau, Wisconsin	-	5,563	5,563	62,952	547	11.3	0.10	-	8
Menominee, Wisconsin	-	4,710	4,710	83,106	1,636	17.6	0.35	-	25
Total	-	23,437	23,437	1,734,605	9,642	74.0	0.41	-	196

* Use Peak Season Employment

Calendar Year Series

TABLE 2 - SHEET 1

ACREAGE WORKED ON NATIONAL FOREST LANDS - 1948

National Forests	NORTH CENTRAL REGION					Second Working Acres	Other Workings Acres	All Workings Acres
	First Working			Total Acres				
	Acres Without Ribes	Acres With Ribes						
Huron, Michigan	-	105	105	-	-	105		
Manistee, Michigan	-	2,260	2,260	1,021	654	3,935		
Marquette, Michigan	-	180	180	200	640	1,020		
Hiawatha, Michigan	-	1,020	1,020	2,085	1,320	4,425		
Ottawa, Michigan	-	910	910	155	1,711	2,776		
Superior, Minnesota	-	2,870	2,870	834	926	4,630		
Chippewa, Minnesota	-	173	173	242	-	415		
Chequamegon, Wisconsin	-	365	365	5,951	305	6,681		
Nicolet, Wisconsin	-	545	545	350	-	895		
Total	-	8,420	8,420	12,838	5,616	24,882		

ACREAGE WORKED ON INDIAN LANDS - 1948

NORTH CENTRAL REGION

First Working

Indian Lands	Acres		Total Acres	Second Working Acres		Other Workings Acres		All Workings Acres	
	Without Ribes	With Ribes							
Grand Portage, Minnesota	-	-	-	335	225	560			
Red Lake, Minnesota	-	-	-	2,079	2,861	4,940			
White Earth, Minnesota	-	-	-	111	375	486			
Nett Lake, Minnesota	-	-	-	112	1,309	1,421			
Bad River, Wisconsin	-	1,442	1,442	408	543	2,393			
Lac Court Oreilles, Wisconsin	-	1,868	1,868	1,278	218	3,364			
Lac du Flambeau, Wisconsin	-	5,563	5,563	-	-	5,563			
Menominee, Wisconsin	-	3,070	3,070	-	1,640	4,710			
Total	-	12,943	12,943	4,323	7,371	23,437			

TABLE 2 - SHEET 5

Calendar Year Series

ACREAGE WORKED ON STATE AND PRIVATE LANDS - 1948

NORTH CENTRAL REGION

State & Private Lands

State & Private Lands	Acres		Total Acres	Second Working Acres		Other Workings Acres		All Workings Acres	
	Without Ribes	With Ribes							
Illinois	-	108	108	-	-	108			
Indiana	-	500	500	1,093	125	1,718			
Iowa	-	180	180	236	89	505			
Ohio	-	1,946	1,946	4,050	233	6,229			
Michigan	-	4,083	4,083	6,267	6,624	16,974			
Minnesota	-	489	489	700	692	1,881			
Wisconsin	-	52,103	52,103	6,403	3,394	61,900			
Total	-	59,409	59,409	18,749	12,157	89,315			

TABLE 2 - SHEET 6

ACREAGE WORKED BY LAND OWNERSHIP - 1948

NORTH CENTRAL REGION

Land Ownership	First Working			Second Working Acres	Other Workings Acres	All Workings Acres
	Acres Without Ribes	Acres With Ribes	Total Acres			
National Forest	-	8,428	8,428	10,838	5,616	24,682
Indian	-	11,943	11,943	4,323	7,171	23,437
Sub-Total - Interior	-	11,943	11,943	4,323	7,171	23,437
Total - Federal	-	20,371	20,371	15,161	12,787	48,319
State and Private	-	59,409	59,409	18,749	11,157	89,315
Grand Total	-	79,780	79,780	33,910	23,944	137,634

TABLE 2 - SHEET 7

ACREAGE WORKED ON INTERMINGLED LANDS - 1948

NORTH CENTRAL REGION

Intermingled Lands			
Michigan	-	1,943	1,943
Total	-	1,943	1,943
		2,031	2,031
		2,952	2,952
		6,926	6,926
Est. Ribes Pulled*	-	9,138	9,138
Net. Man-Days Used	-	115	115
		46,125	46,125
		235	235
		12,642	12,642
		120	120
		67,905	67,905
		470	470

* - Estimates to be based on percentage of total ribes-bearing acreage charged to intermingled lands.

TABLE 3

SUMMARY OF FIELD WORK OTHER THAN RIBES BRADICATION BY STATES AND OPERATING AGENCIES - 1948

State	Operating Agency	Ribes Nigrum				Nursery Sanitation				Treatment of Diseased Pines	
		Number Destroyed	Men-Days	Number Worked	White Pine Nurseries in	Acres Worked	Ribes Destroyed	Men-Days	No. Pines Treated	Men-Days	
Illinois	No Work Done	-	-	-	-	-	-	-	-	-	-
Indiana	No Work Done	-	-	-	-	-	-	-	-	-	-
Iowa	Bureau-State	94	5	-	-	-	-	-	58	0	0
Ohio	Bureau-State	-	-	1	1,000	485	1,051	20	-	-	-
Michigan	Bureau-State	4	21	-	-	-	-	-	120	8	8
Minnesota	Bureau-State	-	-	-	-	-	-	-	11,521	315	315
Wisconsin	Bureau-State	-	-	3	4,925,458	971	739	79	910	10	10
All States	Bureau-State	98	26	4	4,926,458	1,456	1,790	98	12,609	339	339
Grand Total		98	26	4	4,926,458	1,456	1,790	98	12,609	339	339

TABLE A

Accumulative Series - NET

STATUS OF RIBES ERADICATION BY STATES - ALL OWNERSHIPS, DECEMBER 31, 1948

NORTH CENTRAL REGION

State	Total Acres		Control Area		First Working		Second Working		Other Workings		On Maintenance		Remaining Work	
	White Pine	Zone)	(W.P. & Prot.	Zone)	Acres	Per- cent	Acres	Per- cent	Acres	Per- cent	Acres	Per- cent	Unworked Acres	Requiring Rework Acres (Col. 4-8)
Illinois	1,943	13,494			11,265	53.4	10,163		12,622		2,337	17.3	2,229	8,928
Indiana	8,809	188,382			76,439	40.6	20,185		5,970		52,511	27.9	111,943	23,928
Iowa	5,852	50,041			34,233	68.4	7,275		1,297		18,851	37.7	15,808	15,382
Ohio	20,420	466,614			183,032	39.2	47,361		14,356		80,031	17.1	283,782	103,001
Michigan	395,238	1,183,108			1,065,185	90.0	418,432		85,006		420,312	36.2	117,923	636,873
Minnesota	259,316	579,568			374,601	64.6	118,614		34,116		95,746	16.5	204,967	278,855
Wisconsin	439,909	1,455,719			1,176,400	80.8	398,672		36,561		485,788	33.4	279,319	690,612
Total	1,131,487	3,937,126			3,931,155	70.1	1,020,722		189,928		1,163,576	29.5	1,015,971	1,757,579

Accumulative Series - NET

TABLE B - SHEET 1

STATUS OF RIBES ERADICATION ON NATIONAL FOREST LANDS, DECEMBER 31, 1948

NORTH CENTRAL REGION

National Forests

Hoosier, Indiana	18	179	100.0	-	179	100.0	-	-	-	-	-	-	-	-
Wayne, Ohio	520	4,341	92.8	-	4,029	92.8	-	-	-	-	4,029	92.8	312	-
Huron, Michigan	1,423	5,678	99.5	1,628	5,648	99.5	1,628	126	126	4,241	74.7	30	30	1,407
Manistee, Mich.	22,351	69,255	99.9	14,734	69,190	99.9	14,734	5,458	5,458	67,045	96.8	65	65	2,148
Marquette, Mich.	11,323	25,083	100.0	11,945	25,082	100.0	11,945	1,790	1,790	11,485	45.8	-	-	13,593
Manistee, Mich.	11,662	32,929	96.6	15,681	31,809	96.6	15,681	3,590	3,590	16,805	51.0	-	-	15,004
Ottawa, Mich.	11,911	23,343	94.6	17,322	22,083	94.6	17,322	7,170	7,170	7,160	30.7	1,120	1,120	14,923
Superior, Minn.	85,165	135,008	28.9	16,132	39,076	28.9	16,132	8,868	8,868	2,350	1.7	95,932	95,932	36,726
Chippewa, Minn.	13,062	26,406	81.7	10,047	21,581	81.7	10,047	2,135	2,135	15,255	57.8	4,825	4,825	6,326
Chippewa, Minn.	20,457	41,370	81.5	28,392	33,714	81.5	28,392	2,484	2,484	13,461	32.6	7,656	7,656	20,233
Total	12,276	24,174	98.8	19,701	23,839	98.8	19,701	1,660	1,660	8,925	36.9	285	285	14,564
Total	190,166	307,136	71.8	127,125	276,034	71.8	127,125	10,185	10,185	150,953	30.9	113,405	113,405	127,346

TABLE B - SHEET 2.

STATUS OF RIBES ERADICATION ON NATIONAL PARK LANDS, DECEMBER 31, 1948

NORTH CENTRAL REGION									
National Park Lands	Total Acres		First Working		Second Working		Other Workings		Remaining Work
	White Pine	Control Area (W.P. & Prot. Zone)	Acres	Per- cent	Acres	Per- cent	Acres	Per- cent	
Isle Royale	15	120	120	100.0	-	-	-	-	120
Total	15	120	120	100.0	-	-	-	-	120

Accumulative Series - NET

TABLE B - SHEET 3

STATUS OF RIBES ERADICATION ON INDIAN LANDS, DECEMBER 31, 1948

NORTH CENTRAL REGION									
Indian Lands									
Sac-Fox, Iowa	45	500	500	100.0	206	-	-	-	500
Grand Portage, Minn.	974	1,271	1,271	100.0	651	275	0.0	-	1,271
Leech Lake, Minn.	2,432	3,387	3,387	100.0	3,012	502	81.3	-	632
Nett Lake, Minn.	5,252	7,136	7,093	99.4	3,489	1,416	70.2	43	2,063
Red Lake, Minn.	12,473	19,682	19,682	100.0	16,821	12,823	47.0	-	10,435
Vermilion, Minn.	78	186	186	100.0	205	372	0.0	-	186
White Earth, Minn.	481	1,063	1,063	100.0	918	808	51.3	-	518
Bad River, Wis.	8,290	15,294	13,704	89.6	6,085	3,994	63.1	1,590	4,060
LacCourtOroillos, Wis.	12,600	24,000	20,136	83.9	6,813	1,338	27.0	3,864	13,652
LacduFlambeau, Wis.	10,858	20,257	18,254	90.1	6,032	-	72.7	2,003	3,533
Monominee, Wis.	18,813	32,277	29,072	90.1	17,362	4,696	29.6	3,205	19,512
Total	72,296	125,053	114,346	91.4	61,605	25,224	46.4	10,405	56,382

TABLE B - SHEET 5

STATUS OF RIBES ERADICATION ON STATE AND PRIVATE LANDS, DECEMBER 31, 1948

State & Private Lands		Total Acres			NORTH CENTRAL REGION			On Maintenance			Remaining Work	
		Control Area (V.P. & Prot. Zone)			First Working			Second Workings			Other Workings	
		White Pine	Acres	Per-cent	Acres	cent	Acres	Acres	Per-cent	Acres	Acres	Requiring Rework Acres (Col. 4-5)
Illinois	1,943	13,494	11,265	83.4	10,183	12,622	2,337	17.3	2,229	8,928		
Indiana	8,791	183,203	76,260	40.5	20,185	5,970	52,332	27.8	111,943	23,928		
Iowa	5,807	49,541	33,733	68.1	7,069	1,297	18,851	38.1	15,808	14,882		
Ohio	19,900	462,473	179,003	38.7	47,361	14,356	76,002	16.4	283,470	103,001		
Michigan	336,553	1,026,700	911,252	88.8	357,122	66,870	321,576	31.3	115,448	589,676		
Minnesota	139,399	385,429	281,262	73.0	67,328	6,917	60,584	15.7	104,167	220,678		
Wisconsin	356,615	1,298,347	1,037,631	79.9	315,287	22,389	422,973	32.6	260,716	614,658		
Total	869,008	3,484,157	2,530,406	73.9	824,535	130,421	954,655	27.9	893,781	1,575,751		

TABLE B - SHEET 6

SUMMARY OF STATUS OF RIBES ERADICATION BY LAND OWNERSHIP, DECEMBER 31, 1948

Land Ownership		NORTH CENTRAL REGION			On Maintenance			Remaining Work	
		First Working			Second Workings			Other Workings	
National Forests	National Parks	White Pine	Acres	Per-cent	Acres	cent	Acres	Acres	Requiring Rework Acres (Col. 4-5)
190,168	15	387,766	276,281	71.2	134,582	33,283	150,955	111,485	125,326
72,295		125,053	114,348	91.4	61,605	26,224	57,900	10,705	120
12,371		123,179	113,458	91.4	61,605	26,224	57,900	10,705	56,332
66,699		512,922	390,749	76.2	136,197	50,507	200,921	122,190	26,800
869,008		3,424,187	2,530,406	73.9	824,535	130,421	954,655	893,781	1,575,751
1,131,407		3,937,106	2,921,155	74.1	1,020,722	139,780	1,109,516	1,005,971	1,797,579

TABLE B - SHEET 7

STATUS OF RIBES ERADICATION ON INTERMINGLED LANDS, DECEMBER 31, 1948

Intermingled Lands	NORTH CENTRAL REGION									
	Total Acres		First		Second		Other		On	
	Intermingled Lands		Working		Working		Workings		Maintenance	
	Control Area (White Pine & Prot. Zone)	Acres	Per- cent	Acres	Per- cent	Acres	Per- cent	Acres	Per- cent	Acres
Michigan	134,202	126,810	94.5	47,980	9,950	43,411	32.3	7,392	83,399	
Minnesota	71,292	37,361	52.4	2,258	-	3,422	4.8	33,931	33,939	
Wisconsin	24,288	21,374	88.0	18,917	367	7,302	30.1	2,914	14,072	
Total	229,782	185,545	80.7	69,155	20,317	54,135	23.6	44,237	131,410	

Remaining Work		Requiring Rework	
Unworked Acres	Acres	Unworked Acres	Acres (Col. 4-8)

TABLE C - SHEET 1

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES 1918 - 1948

NORTH CENTRAL REGION

State	Operating Agency	FIRST WORKING					SECOND WORKING		
		Acres		Total Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days
		Without Ribes	With Ribes						
Illinois	Bureau-State	2,680	17,350	20,030	1,499,562	3,871	10,183	610,042	2,510
Indiana	Bureau-State	38,937	48,996	87,933	436,577	3,907	20,185	92,179	1,035
Iowa	Bureau-State	-	38,404	38,404	3,539,259	26,990	7,069	659,463	5,069
	Indian Service	-	500	500	13,462	169	206	3,592	57
	Total	-	38,904	38,904	3,552,721	27,159	7,275	663,055	5,126
Ohio	Bureau-State	49,354	156,926	206,280	2,547,335	32,908	47,361	722,524	12,405
Michigan	Bureau-State	-	1,218,637	1,218,637	60,163,446	252,246	362,299	7,146,703	44,499
	Forest Service	-	96,778	96,778	5,179,235	27,527	56,133	1,019,378	10,144
	Total	-	1,315,415	1,315,415	65,342,681	279,773	418,439	8,166,081	54,643
Minnesota	Bureau-State	-	323,722	323,722	44,525,710	110,509	72,800	4,012,200	20,197
	Forest Service	-	66,541	66,541	7,044,281	35,747	21,339	1,387,836	10,919
	Indian Service	-	31,220	31,220	10,245,124	19,223	24,475	2,512,972	11,290
	Total	-	421,483	421,483	61,815,115	165,479	118,614	7,913,008	42,406
Wisconsin	Bureau-State	-	1,154,739	1,154,739	62,179,619	268,848	328,122	5,030,697	43,704
	Forest Service	-	52,461	52,461	4,498,957	28,640	34,258	783,402	9,680
	Indian Service	-	87,454	87,454	20,673,703	67,958	36,292	3,346,959	21,782
	Total	-	1,294,654	1,294,654	87,352,279	365,446	398,672	9,161,058	75,166
All States	Bureau-State	90,971	2,958,774	3,049,745	174,891,508	699,279	848,019	18,273,808	129,422
	Forest Service	-	215,780	215,780	16,722,473	91,914	111,730	3,190,616	30,743
	Park Service	-	-	-	-	-	-	-	-
	Indian Service	-	119,174	119,174	30,932,289	87,350	60,973	5,863,523	33,129
Grand Total		90,971	3,293,728	3,384,699	222,546,270	878,543	1,020,722	27,327,947	193,294

TABLE C - SHEET 2

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES 1918 - 1948

State	Operating Agency	Other Workings				All Workings				Per Acre	
		Workings		Acres		Acres		Acres		Man-Days	Ribes Destroyed
		Acres	Ribes Destroyed	Man-Days	Without Ribes	With Ribes	Total Acres	Ribes Destroyed	Man-Days		
Illinois	Bureau-State	12,622	232,996	3,509	2,800	40,155	42,835	2,642,600	9,892	65.0	0.00
Indiana	Bureau-State	5,970	84,923	264	38,937	75,151	114,088	553,749	5,207	4.9	0.00
Iowa	Bureau-State	1,297	115,756	1,117	-	46,770	46,770	4,314,478	33,176	92.2	0.00
	Indian Service	-	-	-	-	706	706	17,054	226	24.2	0.00
	Total	1,297	115,756	1,117	-	47,476	47,476	4,331,532	33,402	91.2	0.00
Ohio	Bureau-State	14,356	170,038	2,416	49,354	218,643	267,997	3,632,897	47,729	12.8	0.00
Michigan	Bureau-State	69,208	948,391	7,745	-	1,650,144	1,650,144	68,258,540	304,490	41.4	0.00
	Forest Service	15,798	137,239	2,542	-	168,709	168,709	6,335,852	40,213	37.6	0.00
	Total	85,006	1,085,630	10,287	-	1,818,853	1,818,853	74,594,392	344,703	41.0	0.00
Minnesota	Bureau-State	7,936	440,166	2,886	-	404,458	404,458	48,978,076	133,592	121.1	0.00
	Forest Service	9,984	319,424	3,471	-	97,864	97,864	8,751,541	50,137	89.4	0.00
	Indian Service	16,196	1,601,181	8,985	-	71,891	71,891	14,359,277	39,498	199.7	0.00
	Total	34,116	2,360,771	15,342	-	574,213	574,213	72,088,894	223,227	125.5	0.00
Wisconsin	Bureau-State	22,389	389,207	3,574	-	1,505,250	1,505,250	67,599,523	316,126	44.9	0.00
	Forest Service	4,144	71,439	1,597	-	90,863	90,863	5,353,798	39,917	58.9	0.00
	Indian Service	10,028	690,667	5,240	-	133,774	133,774	24,711,329	94,980	184.7	0.00
	Total	36,561	1,151,313	10,411	-	3,729,887	3,729,887	97,664,650	451,023	56.4	0.00
All States	Bureau-State	133,778	2,622,547	21,511	90,971	3,940,571	4,031,542	195,787,863	850,212	48.0	0.00
	Forest Service	29,926	528,102	7,610	-	357,436	357,436	20,441,191	130,267	57.2	0.00
	Park Service	-	-	-	-	-	-	-	-	-	-
	Indian Service	26,224	2,291,848	14,225	-	206,371	206,371	39,087,660	134,704	189.4	0.00
Grand Total		189,928	5,442,497	43,346	90,971	4,504,373	4,595,349	255,316,714	1,115,183	55.6	0.00

TABLE C - SHEET 3

CUMULATIVE SUMMARY OF RIBES ERADICATION BY FOREST SERVICE 1918 - 1948

National Forests	NORTH CENTRAL REGION											
	First Workings			Second Workings			Third and Other Workings			All Workings		
	Ribes Destroyed			Ribes Destroyed			Ribes Destroyed			Ribes Destroyed		
	Acres	Days	Man-	Acres	Days	Man-	Acres	Days	Man-	Acres	Days	Man-
Huron, Mich.	4,241	64,486	503	1,228	147	128	464	5	5,597	91,283	655	
Manistee, Mich.	15,576	143,495	761	13,503	188	4,465	5,971	74	33,544	165,426	1,023	
Marquette, Mich.	23,412	644,988	6,220	11,945	2,435	1,270	6,452	183	36,627	775,213	6,836	
Hiamatha, Mich.	26,281	449,801	4,700	14,926	1,656	3,070	13,410	278	44,277	575,546	6,634	
Ottawa, Mich.	27,260	3,876,465	15,343	14,531	5,719	6,865	110,942	2,002	48,664	4,728,384	23,063	
Superior, Minn.	38,975	4,726,097	23,821	15,291	8,685	8,868	276,316	3,219	63,134	6,145,406	35,725	
Chippewa, Minn.	27,566	2,318,184	11,926	6,048	2,234	1,116	43,108	252	34,730	2,606,135	14,419	
Chasquaagon, Wis.	29,152	2,415,322	15,541	18,585	6,027	2,484	36,457	878	50,221	2,948,163	22,446	
Pleasant, Wis.	23,309	2,083,635	13,099	15,673	3,653	1,660	34,982	719	40,642	2,405,635	17,471	
TOTAL	415,750	16,722,417	91,814	211,120	30,749	25,526	523,100	7,010	387,426	20,447,151	130,607	

TABLE C - SHEET 5

CUMULATIVE SUMMARY OF RIBES ERADICATION BY INDIAN SERVICE, 1918 - 1948

	NORTH CENTRAL REGION									
	First			Second			Third and Other			All Workings
	Workings			Workings			Workings			
	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days	
Indian Lands										
Saw-Fox, Iowa	500	13,462	169	206	3,592	57	-	706	17,054	226
Grand Portage, Minn.	1,620	2,367,154	4,525	651	289,501	1,064	275	2,546	2,700,201	5,856
Leech Lake, Minn.	1,648	326,352	732	2,380	153,271	620	502	90,689	570,312	1,723
Nett Lake, Minn.	7,126	527,722	1,841	3,489	310,850	2,478	1,416	164,080	1,330	5,649
Red Lake, Minn.	20,168	6,740,408	11,216	16,831	1,524,511	6,245	12,823	1,128,585	6,051	23,512
Vermillion, Minn.	286	137,530	424	206	29,912	210	372	40,252	418	1,052
White Earth, Minn.	372	145,958	485	918	204,927	673	808	134,029	543	1,701
Bad River, Wis.	14,673	8,216,882	18,888	6,085	1,216,368	4,991	3,994	541,738	2,397	26,276
LacCourtOreilles, Wis.	17,422	1,413,731	10,601	6,813	390,621	2,709	1,338	5,672	224	13,534
Lac du Flambeau, Wis.	18,422	746,331	4,146	6,032	46,443	370	-	24,454	792,774	4,516
Menominee, Wis.	36,937	10,296,759	34,323	17,362	1,693,527	13,712	4,696	143,257	2,619	50,654
Total	119,174	30,932,289	87,350	60,973	5,863,523	33,129	26,224	2,291,848	14,225	134,704

TABLE D - SHEET 1

CUMULATIVE SUMMARY OF GROSS ACREAGE WORKED BY LAND OWNERSHIPS 1918 - 1948

National Forests	NORTH CENTRAL REGION					
	Forest Working			Second Working Acres	Other Workings Acres	All Workings Acres
	Acres Without Ribes	Acres With Ribes	Total Acres			
Shawnee, Illinois	50	-	50	-	-	50
Hoosier, Indiana	179	-	179	-	-	179
Wayne, Ohio	2,758	1,271	4,029	-	-	4,029
Huron, Michigan	-	6,466	6,466	1,628	128	8,222
Manistee, Michigan	-	69,192	69,192	14,734	5,458	89,384
Marquette, Michigan	-	26,937	26,937	11,945	1,790	40,672
Hiawatha, Michigan	-	30,931	30,931	15,681	3,590	50,202
Ottawa, Michigan	-	29,080	29,080	17,322	7,170	53,572
Superior, Minnesota	-	44,641	44,641	16,132	8,868	69,641
Chippewa, Minnesota	-	36,896	36,896	10,047	2,135	49,078
Chequamegon, Wisconsin	-	39,475	39,475	28,392	2,484	70,351
Nicolet, Wisconsin	-	29,433	29,433	18,701	1,660	49,794
Total	2,987	314,322	317,309	134,582	33,283	485,174

TABLE D - SHEET 2

CUMULATIVE SUMMARY OF GROSS ACREAGE WORKED BY LAND OWNERSHIP 1918 - 1948

National Park Lands	NORTH CENTRAL REGION				
	First Working				
	Acre Without Ribes	Acre With Ribes	Total Acre	Second Working Acre	Other Working Acre
Isle Royale, Michigan	-	120	120	-	120

TABLE D - SHEET 3

CUMULATIVE SUMMARY OF GROSS ACREAGE WORKED BY LAND OWNERSHIP 1918 - 1948

Indian Lands	NORTH CENTRAL REGION				
	Acre	500	500	206	706
Sac-Fox, Iowa	-	1,620	1,620	651	2,546
Grand Portage, Minnesota	-	3,323	3,323	3,012	6,837
Leech Lake, Minnesota	-	7,126	7,126	3,489	12,031
Nett Lake, Minnesota	-	20,168	20,168	16,831	49,822
Red Lake, Minnesota	-	286	286	206	864
Vermilion, Minnesota	-	1,354	1,354	918	3,080
White Earth, Minnesota	-	14,673	14,673	6,085	24,752
Bad River, Wisconsin	-	17,422	17,422	6,813	25,573
Lea Court Oreilles, Wisconsin	-	18,422	18,422	6,032	24,454
Menominee, Wisconsin	-	36,937	36,937	17,362	58,995
Total	-	121,831	121,831	61,605	209,660

TABLE D - SHEET 5

CUMULATIVE SUMMARY OF GROSS ACREAGE WORKED BY LAND OWNERSHIP 1918 - 1948

State & Private Lands	NORTH CENTRAL REGION				
	F i r s t W o r k i n g				
	Aores Without Ribes	Aores With Ribes	Total Aores	Second Working Aores	Other Workings Aores
Illinois	2,630	17,350	19,980	10,183	12,622
Indiana	38,758	48,996	87,754	20,185	5,970
Iowa	-	38,404	38,404	7,069	1,297
Ohio	46,596	155,655	202,251	47,361	14,356
Michigan	-	1,152,689	1,152,689	357,122	66,870
Minnesota	-	306,069	306,069	67,328	6,917
Wisconsin	-	1,138,292	1,138,292	315,287	22,389
Total	87,984	2,857,455	2,945,439	824,535	130,421
					3,900,395

TABLE D - SHEET 6

ACREAGE WORKED BY LAND OWNERSHIP - 1948

NORTH CENTRAL REGION				
Land Ownership				
National Forest	2,987	314,300	317,287	134,582
National Park	-	120	120	-
Indian	-	121,831	121,831	61,605
State & Private	-	121,831	121,831	26,224
Grand Total	2,987	557,982	560,968	209,660
				4,595,449

TABLE E

SUMMARY OF ALL WORK EXCEPT RIBES ERADICATION BY STATES AND OPERATING AGENCIES, 1918 - 1948

State	Operating Agency	NORTH CENTRAL REGION									
		Nurseries Sanitation									
		Ribes Nigrum		Nurseries		Aores		Ribes		Number	
		Bushes Destroyed	Man-Days	Initially Protected	Worked	Destroyed	Man-Days	Still Active	Diseased Number Treated	Man-Days	
Illinois	Bureau-State	751	-	8	2,520	50,378	378	5	-	-	
Indiana	Bureau-State	15	-	6	3,750	11,351	60	2	2	-	
Iowa	Bureau-State	7,293	6,540	8	3,416	67,125	824	1	551	84	
Ohio	Bureau-State	73,117	25,791	14	6,616	60,648	1,910	5	44	16	
Michigan	Bureau-State	147,189	40,113	8	2,734	284,850	6,149	6	41,596	3,217	
	Forest Service	-	-	5	1,952	828,017	10,173	1	-	-	
Total		247,189	40,113	13	4,686	1,112,867	16,322	7	41,596	3,217	
Minnesota	Bureau-State	23,309	12,001	17	5,804	1,324,193	5,017	6	37,200	1,624	
Wisconsin	Bureau-State	37,051	32,137	13	3,611	556,504	4,491	9	910	10	
	Forest Service	-	-	3	1,154	128,753	3,655	1	-	-	
	Indian Service	-	-	1	220	200,660	337	-	-	-	
Total		37,051	32,137	17	4,985	887,917	8,483	10	910	10	
All States	Bureau-State	286,740	116,572	75	20,471	2,358,017	18,829	40	89,303	4,969	
	Forest Service	-	-	8	3,106	956,770	13,828	2	-	-	
	Indian Service	-	-	1	220	200,660	337	-	-	-	
Grand Total		286,740	116,572	84	31,797	3,515,447	32,994	42	89,303	4,969	

TABLE 3

SUMMARY OF ALL RIBES ERADICATION BY STATES, OPERATING AGENCIES AND PROGRAMS 1918 - 1948

NORTH CENTRAL REGION

State	Operating Agency	Regular and Cooperative				All Emergency Programs				All Programs			
		Aeres	Ribes Destroyed	Man-Days		Aeres	Ribes Destroyed	Man-Days		Aeres	Ribes Destroyed	Man-Days	
Illinois	Bureau-State	25,906	740,067	3,403		16,929	1,902,733	5,409		42,845	2,643,800		
Indiana	Bureau-State	54,452	123,723	785		59,636	420,026	4,482		114,088	537,749		
Iowa	Bureau-State	9,767	910,779	8,059		37,063	3,403,699	25,117		46,770	4,314,478		
	Indian Service	500	14,074	168		206	2,980	58		706	17,054		
Total		10,207	924,853	8,227		37,269	3,406,672	25,175		57,476	4,331,532		
Ohio	Bureau-State	50,267	154,300	5,057		201,737	3,285,093	41,872		267,997	3,437,393		
Michigan	Bureau-State	364,751	5,656,431	32,133		1,255,393	62,602,109	272,357		1,650,144	68,258,540		
	Forest Service	71,477	1,128,010	11,470		97,232	5,207,842	28,743		168,709	6,335,852		
Total		436,228	6,784,441	43,603		1,352,625	67,809,951	301,100		1,818,853	74,594,392		
Minnesota	Bureau-State	28,929	1,491,094	12,809		375,529	47,486,982	120,703		404,458	48,978,076		
	Forest Service	35,745	2,260,873	20,088		62,118	6,490,668	30,049		97,864	8,751,541		
	Indian Service	25,313	4,062,716	16,776		46,578	10,296,561	22,722		71,891	14,359,277		
Total		89,987	7,814,683	49,673		464,225	64,274,211	173,474		574,213	72,088,894		
Wisconsin	Bureau-State	563,457	8,489,329	43,600		941,793	59,110,194	272,526		1,505,250	67,599,523		
	Forest Service	34,851	725,347	10,202		56,012	4,638,451	29,715		90,863	5,353,798		
	Indian Service	61,020	3,855,795	27,682		72,754	20,855,534	67,298		133,774	24,711,329		
Total		659,328	13,070,471	81,484		1,070,559	84,604,179	369,539		1,729,887	97,664,650		
All States	Bureau-State	1,137,462	17,577,027	106,806		2,894,080	178,210,836	743,406		4,031,542	195,787,863		
	Forest Service	142,074	4,104,230	41,760		215,362	16,336,961	88,507		357,436	20,441,191		
	Indian Service	86,833	7,932,585	44,626		119,538	31,155,075	90,078		206,371	39,087,660		
Total		1,366,369	29,613,842	193,192		3,228,980	225,708,872	922,991		4,595,349	255,316,714		

